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# Computer Weekly

Thursday, May 6, 1982

## Univac launches a twin-pronged attack

by Kevin Cahill

A POWERFUL two-pronged attack on both the IBM mid-range market and the personal computer market was announced this week by Univac.

The drive on the IBM 4331 market is being led by a new entry level machine called the 1100/61 B1.

Joe Pascoe, UK marketing manager for Univac, claims that the B1 is 25% more powerful than the IBM offering and is price competitive. The entry level price for a 4331 is around £150,000.

Perhaps more important to existing or potential Univac users is the fact that the B1 represents a lower start point than the existing Univac 1100/61 C1, which is about 20% more powerful than the B1.

Pascoe claims that the B1, which is field upgradeable to the C1, will give new entrants access to a growth path all the way up to the top-end 1100/64 multiprocessor systems.

According to Pascoe, orders for the Univac 1100/60 mainframe range were 12% up on last year, with particularly strong growth experienced in the past three months. The upsurge in the first quarter this year was most noticeable in the International division, he said.

Univac's route into the personal computer marketplace follows that taken by DEC with the VT 100. Univac has produced a board upgrade to the programmable UTS 40 terminal, which allows a user to run CP/M with 64K of additional RAM.

The upgrading of the UTS 40 gives Univac users access to the huge database of CP/M application software which now exists, as well as enabling the UTS to be used as a personal micro and a remote intelligent terminal.

The product is expected to be available to UK users in October. No price was quoted by Univac but a field upgrade price of about £500, and perhaps half that for the terminal with the board included is what existing users expect to pay.



PASCOE... "B1 25% more powerful than IBM offering."

## Scicon to try unexploited UK field

by Philip Hunter

THE largely untapped market for facilities management services in the UK is to be exploited by a joint venture between Scicon and US software products giant Applied Data Research.

Scicon will offer ADR's full facilities management service on IBM computers and attack the present UK dominance of the market by Hoskyns.

Under a facilities management contract, a company can divest itself of all responsibility for running its data processing operation. Companies switching to a different make of mainframe, or moving from a central to a distributed net-

work but who lack computing experience, are prime candidates for such a service.

The facilities management market in the UK has been static, running at just £9 million for the last two years out of a total UK system services market worth £600 million.

The US government invests heavily in facilities management, while the UK government has little to do with it. But Gerald Watson, head of the Central Computer and Telecommunications Agency, has said that there is a great deal of potential for more business in facilities management.

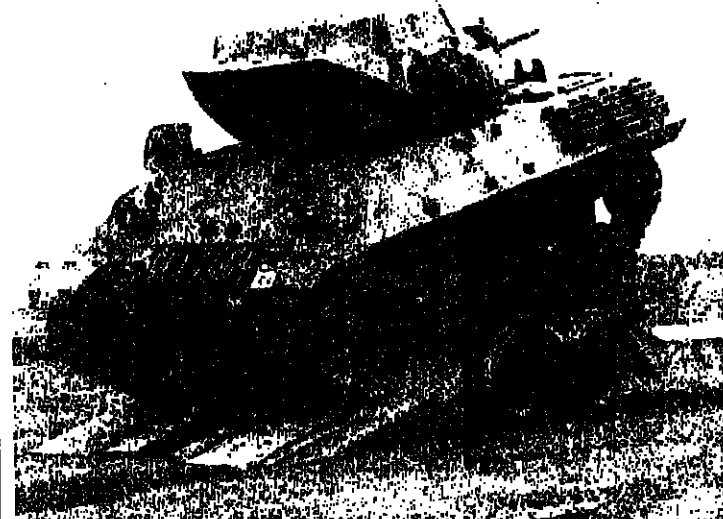
Doug Eyleons, Computer Ser-

vices Association director general, says he has been urging the government to put more work out to facilities management companies.

But Scicon's processing control manager Chris Baker is sceptical. "I don't see the government changing its approach," he says, adding that the service companies are likely to remain the biggest users of facilities management.

Eyleons believes the Scicon deal is significant and expects it to have a salutary influence on the overall UK facilities management market.

Amdahl is one of three major sub-contractors under BDS, the



The US DoD contract was awarded in the face of IBM's competition.

## Big break for Amdahl

by Kevin Pearson

A MAJOR slice of a massive US Defence Department contract has been awarded to Amdahl, the plug compatible computer manufacturer, in the face of strong competition from IBM.

As part of a contract whose total value is \$655 million, Amdahl is to supply the US Army with 20 470 series computers for its five data centres. Four of the machines will be delivered next year, and the other 16 over the remaining period of the 10-year modernisation programme, code-named Project Viable.

The deal is worth \$45 million to Amdahl, about 8% of its annual turnover. It is the largest single order the company has received, and it comes at the right time for Amdahl, which two weeks ago reported first quarter profits down by over 50% to \$4.2 million.

Amdahl is one of three major sub-contractors under BDS, the

large US systems house, for Project Viable. The others are IBM, which is to supply 4341 processors to 47 local US army sites around the world, and US software products giant ADR.

The major competition for the EDS/Amdahl tender for the Data Centres came from Computer Sciences, with IBM supplying the hardware.

ADR is to supply a major database system based on its Datacom products. In the longer term a worldwide network will be built-up under ADR's Dnet networking system.

The software deal is worth \$14.2 million over 10 years, the biggest single software contract that the US Army has ever issued.

Other companies involved in the BDS contract are NCR, which will supply front-end systems for the project, and Storage Technology, which will provide the project with disc drives and other peripherals.

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# Computer Weekly

Thursday, May 13, 1982 Number 808 30p

## Three personal machines launched

# Hard-sell for DEC micros

by Boris Sedacca

THE world's largest minicomputer manufacturer, Digital Equipment has at last put its full weight into the microcomputer market. Despite a range of products which show no strong advantages over its competitors, the company represents a potent new force in the field through the strength of its existing marketing channels.

In addition to sales through existing OEMs and terminal distributors it will also be selling direct to large accounts. And in the near future it plans to sell to users through office equipment vendors and retail chains.

DEC has launched three separate products as part of its personal computer family, two of which are based on existing or resurrected minicomputer architectures. For the third product, however, the company has turned to an outside manufacturer for microprocessors, abandoning its past strategy of continually squeezing down its minicomputer architecture on to fewer chips.

At the top-end of the range is the Professional series based on the PDP-11/23 processor chip with 256 Kbytes of memory and multitasking operating system, followed by the DECmate II word processor based on the old 12-bit

PDP-8 minicomputer with optional capability to run the CP/M operating system.

But the most significant product is the Rainbow 100 at the bottom end, running CP/M applications on both the 280 eight-bit processor and the 8088 16-bit processor.

The 8088 is used on the IBM Personal Computer which has yet to be launched in the UK. At present, the only production machine available in the UK which runs the 8088 is the Sirius 1 sold by ACT Microsystems. Commodore has announced its Series 700 for September which will support the 8088, and the UK manufacturer LSI Computers is planning to bring out an 8088-based inkjet in the summer with help from the government under its Microprocessor Applications Project (MAP) support scheme.

DEC will use the Rainbow to extend its customer base into the mainstream personal computer market, and to move that customer base up into its minicomputer range. Some software products and facilities announced with the personal computer family for instance, will be available only on the Professional series based on the PDP-11. These include a graphics capability and a Telephone Management System option which dials and receives phone calls.

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CAPTAIN HILTON... We don't even care if the Russians have it.

## Leasco helps out Navy in the Falklands war

by Philip Hunter

AMID a mist of secrecy, the Royal Navy has allowed a brief glimpse of an advanced military information system which is currently being used to aid naval action in the Falkland Islands.

The combination shore- and ship-based system provides naval commanders with a powerful tool to monitor the movements of enemy aircraft and ships.

It was developed on Ferranti hardware by Leasco Software of Maidenhead, and delivered to the Navy last August.

Since then the system, known as Britmiss, has been implemented at Navy headquarters and in three ships, although a Ministry of Defence spokesman says that it was not on the ill-fated Sheffield destroyed by an Argentinian missile two weeks ago.

Until Britmiss was developed, the Navy was forced to rely on ship detection methods (such as helicopters) which gave little freedom to manoeuvre outside the maximum range of tactical weapons carried by the enemy.

Now, ship and aircraft locations together with security classifications can be plotted continuously on a large shipborne terminal which also has the ability to draw coastline and contour maps of any part of the globe. The terminal screen can be interrogated by a light pen, which when placed on a particular ship, brings forward the original details of the vessel programmed into the system.

Data in the system is built up on shore using details that are readily available on existing teleprinter networks. The information is then transmitted to ships and remote maritime headquarters by communications satellite.

Since the system has been delivered the Navy has been back to Leasco for a number of enhancements. These include a "dead reckoning facility" - the ability to extrapolate information, which is typically several hours old, to yield present estimated positions of ships and aircraft.

Britmiss took 15 months to develop, for a price of £900,000.

It was conceived by Captain John Hilton of the Royal Navy, who emphasises the importance of the system's ability to communicate messages in a code of frequently changing format. As a result there is no need to make a big secret of the system.

"We don't even care if the Russians have it," says Hilton.

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## NEWS BRIEF

### Burroughs' desk-top micro

BURROUGHS last week became the latest mainframe vendor to offer a desk-top computer. The company's B21 and B22 systems, designed and built by Convergent Technologies of Santa Clara, California, will offer maximum memory capacities of 512K and 640K respectively, with typical selling prices from \$8,000 to \$20,000.

The new micros represent Burroughs' attempt to recapture its once dominant position in the small systems market.

### More jobs

MANAGEMENT recruitment in electronics design and in computing is on the rise again, reflecting a growing confidence in the future. Appointments advertised in research, development and design - particularly engineering and electronics - in the first quarter of this year showed a 90% rise over the same quarter last year, while computer jobs, although growing at only 24% over the year, show a 60% increase over the last quarter of '81.

### £3m bank order

BSI, FISH banking is set to enter the electronic age in a big way as National Westminster orders £3 million computer equipment for its Epsom branch.

### Autumn Gateway

ICL has announced Gateway software for its Bulletin private viewdata system on the ME29. Gateway will be available in the autumn, and will allow access between private viewdata services using Bulletin and national viewdata systems such as Prestel.

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## Rent-a-package in July

by Robert Parry

BRAVING the troubled waters of software copyright, an offshoot of mail order business Apple Orchard is to set up a microcomputer software library for short-term rental.

The Software Rental Bank hopes to get going in July with a list of around 140 well-known, though not necessarily widely used, application packages for the Apple II. Other micros will be added later.

The packages will include business products - accounting packages, word processing software, database management systems and the like - from software houses including ACT, Microsoft, Systems, TABS and CompSoft. Apple Computer's own packages will be on offer too, as will DJV 'AT' Systems' The Last One.

Joint managing directors John Chesney and David Imberg see the main problem as the pirating of software - renters hiring packages to make copies, along the lines of what happens with record libraries.

"The software suppliers are worried too," says Chesney, "but we believe the existence of the software rental bank will expand their market by making it easier to get access to things."

The argument is that suppliers will gain more through greater sales - Chesney is hoping for a high conversion rate of rentals to sales - than they will lose through illegal copying. He also reckons, optimistically perhaps, that most renters will be companies unwilling to run risks with unsupported pirated software.

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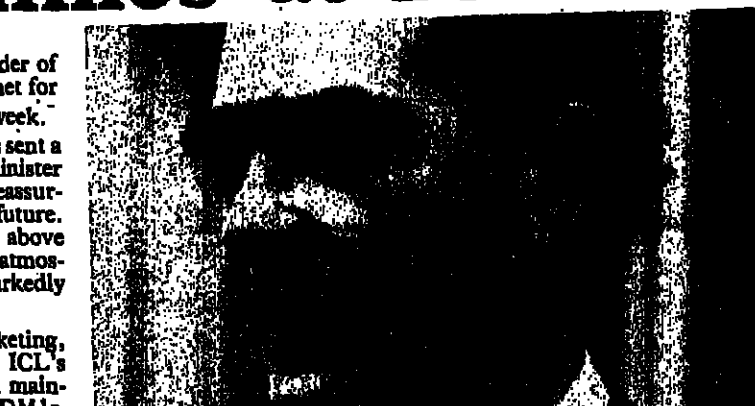
## All smiles at ICL conference

by Andrew Thomas

SMILING faces were the order of the day as ICL's UK users met for their annual conference last week.

In 1981, worried delegates sent a telegram to the Prime Minister with an urgent appeal for reassurance about the company's future. This year, with shares back above the magic 50p mark, the atmosphere at Eastbourne was markedly more optimistic.

Director of product marketing, Niall Badie, re-affirmed ICL's policy of surrounding IBM mainframes with ME29s and DMIs, and again denied reports that ICL was about to go IBM plug-compatible or adopt its SNA communications standard in place of ICL's own Information Processing Architecture (IPA).



BADIE... "We're sticking with international standards."

"We're sticking with international standards," said Badie. "IPA sells on superior price/performance."

In an unexpected about-face, ICL suspended its policy of open

management and excluded the Press from managing director Robb Wilton's address.

But according to delegates there was a distinct emphasis on the old DME emulation system, rather than its supposed replacement, CME, which allows both native mode and alien ordercode execution simultaneously.

"Maybe DME is making a comeback," mused one delegate. But it could mean that ICL is not exerting as much pressure as expected on 1900 and System 4 users to move to VME 2900.

Considerable interest was created by Wilton's announcement that the DRS range will shortly be capable of running the CP/M microcomputer operating system as a subject program under the DRX operating system.

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Compec Europe provides launch-pad for 13 British firms. Kevan Pearson reports from Brussels

## UK companies make push on to Continent

A MAJOR push into Continental Europe by 13 UK companies had its send off in Brussels last week at Compec Europe, sponsored by Computer Weekly.

The 13, ranging from employment consultants to software and systems houses to microcomputer manufacturers were taking part in a joint venture backed by the Business Equipment Trade Association, Beta, and the British Overseas Trade Board.

A prominently displayed sign, "Recherchons Agent", literally "Looking for agents", was on each of the companies' stands. Many of them were at Compec Europe for the first time, using the exhibition as a way of feeling out the market for their services or products, as well as looking for potential agents and distributors.

Participation by the companies was part-financed by the BOTB, and organised by Beta.

Some of the companies, in only the second or third year of operation, would not have made the exhibition without the assistance of BOTB/Beta joint venture.

It was the second such venture since Compec took over the Brussels exhibition in 1977. The first took place in 1980, but last year there was not sufficient interest by potential exhibitors to qualify for BOTB help.

Phil Bowe, a director of Tamysa, one of the few software companies at the exhibition, said that in the first half-day the company received enough serious interest in its products to justify its presence. Tamysa had a variety of equipment and systems on show, including Extel's Hi-net local area network, and a manufacturing control program which is built around the MDBS relational database for microcomputers.

Tamysa uses both products in its own development work. "We have been using MDBS for several months," says Bowe. "It's very powerful, and has cut our software development time by about 45%."

David Fear, marketing director of British micro maker Comart and former international marketing director of Prime Computer, said his company had made some "very good contacts" at the show.

Fear joined Comart in January to provide international sales expertise. For Comart's push into Europe, Compec Europe is just one aspect of the company's strategy to tap the market.

A few of the companies, like Dicol Electronics of Basingstoke and Plessey Microsystems, already have Belgian distributors. Their presence was essentially to introduce new developments and to back-up the local agents.



FEAR... "Very good contacts at the show". With him (left) at Compec Europe is John Lamb, marketing director of Comart.

## Micros out in force at exhibition

THERE was a strong micro flavour at Compec Europe, but most were shown by local distributors rather than the manufacturers.

The British flag was flown by Comart, Dicol Electronics and Tamysa.

County Computers, of Worcester, showed what is effectively a repackaged Apple II called Ac-Tamsa.

There is still life in bubble memories, in spite of the withdrawal of several big name manufacturers last year. At Compec Europe Plessey Microsystems showed a 24 Mbyte mass memory system, based on one Mbyte bubble memory chips.

claim. It is based on an Apple II board, with an integral hard disc system, and an extensively redesigned box and keyboard.

The IBM Personal Computer was also there, but not with IBM. Microcomputerland seems to have started a trend with its unofficial importation of IBM's micro. A Dutch company called Vullwood

Computers has now followed suit and is marketing the machine in Holland and the Benelux countries.

The Japanese presence was marked by Sord Computer Systems' European distributor Egemin, which showed most of the Sord range, except the 16-bit M416.

## Long-term future for bubble-based systems

There is still life in bubble memories, in spite of the withdrawal of several big name manufacturers last year.

At Compec Europe Plessey Microsystems showed a 24 Mbyte mass memory system, based on one Mbyte bubble memory chips.

It has been marketing a six Mbyte system for some time, based on 256 Kbyte chips.

The bubble market looked like collapsing last year when Texas Instruments, National Semiconductor and Rockwell all announced that they were stopping

production of bubbles. Now the only mainline manufacturers still involved are Motorola and Intel. Plessey, according to European sales manager Phil Burnley, sees a long-term future for bubble-based systems in replacing hard disc systems.

## Geisco finance package for IBM equipment

by Maggie McLening  
AN in-house financial modelling system for IBM and plug-compatible equipment has been launched by time-sharing bureau Geisco. A version for the IBM Personal Computer is expected to follow.

The launch is in line with the trend for bureaux to widen the scope of their services. It follows a prediction last year by Gregory Liemandt, president of Geisco, that by 1985 90% of the company's revenue would come from this type of service, rather than its traditional time sharing.

He also said that Geisco had set a target to triple current revenues to \$1.5 billion by 1986, and the CPL-Tactix system is the first of a series of packages aimed at achieving that figure.

The new package, called CPL-Tactix, was originally developed by the Swedish software house Mercur Planeringspraktik. It is a

table database, similar to a greatly expanded version of VisiCalc.

Any Fortran-readable file is formatted into a matrix with a maximum size of 10,000 items. It can be linked with up to 500 other tables in a single library, and with up to six other libraries.

One of the most important features of the system, apart from its set-handling abilities, is the option of colour graphics and comprehensive screen handling if used with an IBM 3270 interface.

Commercial release of the product to run under MVS or CEM/CMS operation systems is due on May 15.

Available both as an in-house system or on the time sharing bureau, CPL-Tactix costs \$11,000 for a complete module including support and software updates. Geisco already has four time sharing customers in the UK, with the first US client set to install it in June.

## £90 million Videotex order

by Jack Geo  
FRANCE has won its biggest export contract for videotex terminals. Tymshare in California has placed a £90 million order with Matra for 560,000 units which Tymshare will distribute in the US with its electronic mail and database services over the next ten years.

The order is a follow-up to last summer's initial contract between Matra and Tymshare for delivery of 100,000 terminals.

The new Tymshare order is a major success for Matra's chairman, Jean-Luc Lagardere. He regards the US as the launching pad for an attack by his company on the international videotex market.

## SALES BRIEF Ferranti £1m oil rig deal

FERRANTI has won a contract from Conoco for a £1 million oil rig computer system to adjust its movement and anchor cable tension on the world's first tensioning oil production platform.

The system will take account of loading and weather conditions, keeping it in its proper position. Hutton North Sea oilfield. It consists of two Ferranti Argus 1002 minis with telemetry units, drives and other peripherals.

## Picture library

SATISFACTION with the Logica Context teletext system is leading to a major supermarket chain has one, with Key Markets leading the field with three.

Nielsen says that if the US trend towards the new PoS technology is followed, up to 50 grocery outlets will be equipped by the end of 1983.

## Tailor-made

ICL has won a £250,000 order for 9500 series point-of-sale terminals, tag readers and floppy disc controllers to be installed in the branches of Burton's, the tailors.

France. One or two ICL 9512 terminals and a controller will be installed in each branch to deal with sales transactions and stock movements. Summaries will be transmitted to Burton's mainframe in Paris overnight.

## CAD debut

GKN Technology has bought its first implementation of the Meta Datasystem Euclid computer-aided design and manufacturing system to be installed on a Digital Equipment VAX in the UK. The system is marketed jointly by DELC, Matra throughout Europe. GKN is installing it on a VAX 11/750 and will use it for a range of functions from drafting to solid modelling in conjunction with its own analysis software.

## 20th system

BOLINGBROKE & Wenley, of Chelmsford-based department store has taken delivery of the 20th KPG-Store system from Solihull KPG. It provides sales ledger, purchase control and departmental reports. The £27,500 order is based on a 128K Data General G190 system.

## Graphics link-up

INTERNATIONAL architectural and building firm JT Design Build has installed a £125,000 Calcomp IGS 500 computer-aided design and drafting system to be used in producing design schemes and working drawings. It will also be linked to the firm's existing Systime VAX 11/750 to transfer graphics and data files for quantity estimating and technical calculations.

Stratus, formed in 1980, introduced its first product late last year. The Stratus will be marketed in Europe by Olivetti, which demonstrated the system at the Hannover Fair.

Stratus offers a hardware-based solution to non-stop computing which it claims is superior to Tandem's NonStop. Reduced application development time and lower operating system overhead without the need for complex error detection and recovery software is claimed.

Stratus also claims to offer growth by adding "processing modules" up to a maximum of 32 to support up to 2,000 terminals, against the "traditional upgrade approach" of removing older processors and replacing them with newer ones.

Stratus, formed in 1980, introduced its first product late last year. The Stratus will be marketed in Europe by Olivetti, which demonstrated the system at the Hannover Fair.

## Funds transfer

APPLIED Communications has won its first major UK banking contract with a deal to supply an online electronic funds transfer system to Bankers Automated Clearing Services. The system should provide both shorter response times and additional facilities at BACS Edgewood data centre, and is based on Tandem Non-Stop II technology.

## Bar code scanning for 1,000 UK retail outlets by 1990 — market survey

by Andrew Thomas  
BY the end of the decade, at least 1,000 UK retail outlets will be using electronic point of sale equipment incorporating laser scanning techniques, according to market survey company A. C. Nielsen.

There are currently only nine installations in the UK. Each of the major supermarket chains has one, with Key Markets leading the field with three.

Nielsen says that if the US trend towards the new PoS technology is followed, up to 50 grocery outlets will be equipped by the end of 1983.

Tesco plans to have a total of 15 stores operating PoS installations this year.

Laser scanning requires all goods to be bar coded in order that the product may be identified by the hardware at the checkout.

Nielsen estimates that over 70% of goods sold through supermarkets currently carry such codes, and that in many product categories over 90% of items are already suitably coded.

Nielsen has been appointed by the Article Number Association as the central UK clearing house for data collected through PoS systems operated by retailers.

But a report\* from the Distributive Trade Economic Development Committee (EDC) predicts that the magic 1,000 mark will be reached nearer 1985 than 1990. It says that Spar, the group of small independent supermarkets, expects at least 1,000 of its members to be using laser scanners by the end of the decade.

The EDC maintains that, for the majority of UK shopkeepers, their first encounter with information technology will be with PoS equipment. Other aspects of new technology lie further in the future.

Electronic funds transfer (EFT) and shopping from home via

viewdata are cited.

The NEDO report calls on the government to give the distributive trades more help in the form of additional funds "to encourage more widespread introduction of new technology."

One of the potential problems highlighted in the report is the education of the general public in order that they both understand and accept the reasons behind the disappearance of price tags on goods.

In the US, where almost 5,000 supermarkets are using PoS laser scanning, retailers are only now beginning to discontinue item pricing after five years' use of the equipment.

There has been a fierce resistance from consumer groups, who insist that it is vital that shoppers can price their purchases as they go into the trolley.

\*Technology: The Issues for the Distributive Trades. NEDO Books, Millbank Tower, Millbank, London SW1P 4QX. Price £3.

## 'Non-stop' US legal battle

by Boris Sedacca  
"NON-STOP", or resilient computers have become the focus of a legal battle in the US as companies prepare for the expected rapid growth in the market.

The company which pioneered non-stop computing, Tandem, has taken a newcomer, Stratus, to court, alleging that Stratus is using false advertising to knock the competition.

Stratus offers a hardware-based solution to non-stop computing which it claims is superior to Tandem's NonStop. Reduced application development time and lower operating system overhead without the need for complex error detection and recovery software is claimed.

Stratus also claims to offer growth by adding "processing modules" up to a maximum of 32 to support up to 2,000 terminals, against the "traditional upgrade approach" of removing older processors and replacing them with newer ones.

Stratus, formed in 1980, introduced its first product late last year. The Stratus will be marketed in Europe by Olivetti, which demonstrated the system at the Hannover Fair.

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## User wins Burroughs damages

by Howard Karten  
ANOTHER small business computer user has won a legal suit against Burroughs in the US. The case, involving a B800, comes on the heels of a recent victory for Texas-based Nelson Speciality Company, which won its case but was awarded no monetary damages.

Some 160 lawsuits involving Burroughs small business systems, mainly the B80 and B800, are outstanding in the US.

In the latest case, Century Automotive Machines, a Twin Falls Idaho B800 user, had sued for \$335,000 in actual damages and \$500,000 in punitive damages. The jury in Idaho found for Century, awarding \$47,200.

Thomas Stephan, Century's counsel, indicated that he might appeal against the award on the grounds that the judge rejected a plea for punitive damages.

New Hampshire attorney Thomas Christy, who has been coordinating a number of lawsuits against Burroughs, said the company's failure to attempt out of court settlements was "a shortsighted, dumb outlook".



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## MICRO NEWS

Half height  
floppies

TEKDATA Electronics, UK agent for Teac, will stock half height 5¼-inch floppy drives in production quantities from July. The two Teac products, FD-55E and FD-55F, give half and one Mbyte capacities respectively in half the space of standard floppies.

## Intel modules

HARDWARE and software modules for Intel's System 86/330 are available off-the-shelf from the distribution division of MEDL in Lincoln. This system can take up to three loosely coupled intelligent boards and includes RAM and fast mass storage.

## Magic order

IRISH computer and automation systems supplier Mentec International of Dublin has plumped for SPL's RTL2 for real time projects. The SPL micro development package based around the Magic language will be used exclusively for such software development, says managing director Mike Pierce.



NOYCE... SRC does not want to depend on a few sources of finance.

Multi-company co-ops  
in bid to cut R&D costs

by Robert Parry

THE desire to cut massive research and development costs and valuable manpower resources is proving a potent force for bringing about collaboration between US electronics and computer firms.

Two multi-company ventures first proposed last year are now underway and look certain to produce results.

First off the mark is a research co-operative under the auspices of the US Semiconductor Industry Association.

First year funding for the project will be \$6 million, and it will start with 13 participating companies. The Semiconductor Research Co-operative is designed to provide contract support to US universities for long-term semiconductor research projects.

It will be a non-profit organisation and, once more companies are signed up, is expected to reach a \$25 million annual budget.

Manpower shortages and the growing cost of semiconductor R&D are the main motivations behind the venture, says Intel's Robert Noyce, chairman of the SIA.

It is hoped that support of generic research will increase facilities for more students while eliminating duplication of R&D within industry.

Funding for SRC will come from participants according to their sales or production of semiconductors, Noyce says, adding that no one company will put up more than 10% of SRC's funds.

SRC does not want to be dependent on a few sources of finance only, Noyce explains. In return for putting up money, the companies will receive licences for any patents obtained by the research organisations.

Although SRC has been set up as an answer to the US semiconductor industry's foreign competition, particularly from Japan, its charter provides for membership by non-US companies.

But the terms of such membership, which demand that all other SRC members have equal rights to participate in similar co-operative programmes in the other countries, are thought unlikely to bring many takers.

Executive director of the cooperative is to be Larry Sanger, previously director of the US government's very high speed integrated circuit (VHSIC) programme. Companies taking part include large producers and Intel, National Semiconductor, IBM, DEC, Honeywell, Motorola, and Burroughs.

The topics the co-operative will be looking at to develop a large range research strategy include packaging alternatives for VLSI lithographic systems; semiconductor materials; chip reliability and CAD techniques. In the short term it will be looking at the effects of IC defects and the prospects for gallium arsenide technology.

While the SRC is getting a second venture, Control Data Microelectronics and Computer Technology Enterprise (MCE) has established its financial and organisational structure. The forces made up of representatives of the 15 companies which attended last month's meeting have been set up to formulate development proposals.

NatSemi tops Sperry's  
'quality chips' league

FOLLOWING hard on reports that US semiconductor companies now rival Japanese parts for quality, National Semiconductor has been placed top of the league for supplying quality devices to computer manufacturer Sperry Univac.

Sperry, in the US, tests samples from each incoming lot and regularly evaluates its nine domestic US and international suppliers. Criteria for evaluation are electrical and mechanical defects in incoming devices and lot rejection rates.

"NatSemi was well ahead of our other suppliers in every area evaluated," says Sperry's US product integrity manager Duane Georges.

The quality of semiconductor components shows a general improvement average over all suppliers. Sperry's test records indicate a fall in electrical defect rates from 7,000 defective parts per million incoming units in 1978 (all suppliers combined) to 2,800 in 1981.

NatSemi's performance over the

same period showed a drop from 5,000 defective parts per million to 600.

Other large users of semiconductor components, memory chip predominating in volume terms, are seeing the same sort of improvement in device quality. For example Control Data reports acceptance currently running at 99% for its major suppliers.

But there is still a perceived difference between Japanese and US quality in the minds of the public, and the US semiconductor manufacturers — who regard the quality gap as a thing of the past — are struggling to correct public opinion.

They lag behind the Japanese manufacturers in co-operation between buyers and suppliers. The industry is unable to match the feedback achieved by the vertically integrated Japanese companies. As if to confirm NatSemi's improving quality performance, the company's plants in Santa Clara and Tucson have been re-certified by the US Defence Department and it is due back on the military qualified parts list this month.

## Apple Pi for industry

FOR those wanting to use the familiar Apple II personal computer in harsh industrial research and factory environments, a repackaged version is available from Newbury-based MC Computers.

Called Apple Pi, the system is made up of a repackaged Apple and floppy disc unit in a sealed metal enclosure to keep the machine out of the way of dirt, electrical noise and vibration.

User-definable push buttons are provided on the standard version

of Apple Pi which can resist operator intervention in the running of the machine to a degree pre-programmed by the user. The computer and disc unit, with its automatic boot-in facility, are kept out of harm's way.

Advantages claimed by MC Computers for the machine include the ability to develop applications on a normal Apple II in the laboratory, then transfer them directly to the machine in the process room or on the shop floor.

## Ford sets up IC centre

US CAR giant Ford Motor Company has set up a subsidiary to design integrated circuits for the company's aerospace and automotive products, Ford Microelectronics will begin design work towards the end of this year, with a design staff of between 70 and 100.

A projected high demand for computer and general electronics ICs, rather than the low volume products needed for Ford's automotive and other applications, lies behind the company's move.

It does not want to get left short of supplies at a time when IC designers and support personnel are

in demand if a general upturn materialises.

Ford currently uses many standard ICs and custom circuits designed by outside semiconductor manufacturers. The need for the custom chips is growing. This, along with greater availability of "silicon foundry" operations (manufacturing chips from customers' designs), has led to such as Motorola, United Technologies and National Semiconductor, and development of a design centre for Ford to set up design on its own.

## SOFTWARE FILE

US firms seek  
British products  
for takeover

NOT content with exporting its native software, the US is looking to the British market to find packages for European distribution, or for sale in the UK.

Differences in accounting and language between European countries and the US mean major amendments to software, often involving information which is difficult to obtain outside the country concerned. Some American companies such as The Office Manager (TOM) which provides software for Wang machines, tackle the problem by appointing distributors based in the countries, making them responsible for conversion of the US product and for the subsequent maintenance.

In recent months another trend has appeared: that of buying software companies outright to obtain exclusive rights to their products, and with the spin-off that they will continue to write software that the US parent can market in Europe.

The recent acquisition of CSA Microsystems of Gerrards Cross by software distributor Peachtree, now owned by Management Sciences America, is a prime example. CSA Microsystems' "Jowry" was a complete range of accounting packages written in GKS Cobol, which Peachtree wanted both to complement its own MBasic programs and as an entry into a wider commercial market.

Although Peachtree denies that USA Microsystems will now be writing software to order, managing director John Hales said that

he expected to have "some influence" over what is produced.

Anglicising American software, however, is only one side of the coin: variations in distribution rights also play a large part in making UK-produced software look attractive.

Problems in acquiring rights in the US do not exist over here, according to Patrick Shannon of Softmatics Corp, a software distributor based in Massachusetts which is shopping in the UK for IBM-compatible products, with an initial budget of £100,000.

"In the States it is almost impossible to get exclusive rights to anything, because of the differing laws in each state," he said. "The beauty of British software is that you can buy it outright."

California-based Ashton-Tate, a division of Software Plus, has a large budget of about £500,000 and a wider brief, covering any CP/M-based system that looks promising.

"We are looking for any kind of software that is unique and exportable," explained George Tate, president of Ashton-Tate. "The best overall software products are now coming from Japan, Germany and France, but the language problems are much greater."

According to Tate, the company is covering all its options by also looking for partners to assist in solving language problems, rather like the method adopted by TOM. He is also keeping his options open on the channels of contact.

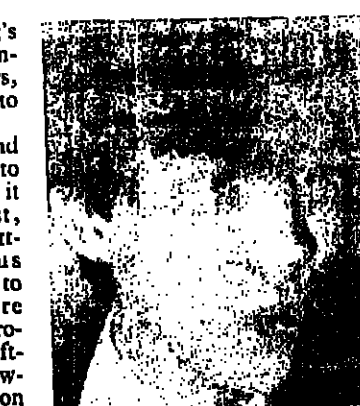
Caxton's card index  
gets HP Plus backing

CAXTON Software Publishing's second-born, an electronic card index system for microcomputers, may be the company's passport to international sales.

I launched in the US at the end of March, where, according to Caxton director Dave Tebbutt, it aroused considerable interest. Cardbox is to be listed by Hewlett-Packard under its HP Plus scheme. HP Plus is intended to encourage third-party software suppliers by including their products in a list of "referenced software", effectively putting a Hewlett-Packard "seal of approval" on the package, and giving the supplier the benefits of a sales force worldwide.

Written by Martin Kochanski of Business Simulations, a firm of management consultants, Cardbox is aimed at the non-computer user who needs to keep a card index of information such as contact names and addresses, press-cuttings, or product details, but doesn't need or want to know about programming. All commands are in English and abbreviations are given full explanations at the bottom of the screen.

"One of the main selling points is that it is universal, and it is possible to index items under any



KOCHANSKI... "Universality is a selling point."

selected heading," pointed out Kochanski. "You can also display and print information in lots of different ways."

Cardbox costs £155, keeping it in line with Caxton's policy of prices around the £200 mark, and runs on any microcomputer with a CP/M operating system.

According to Bill Yarrow, one of the three directors of Caxton, dozens of copies were sold on the Osborne 1 computer prior to the US launch, and Caxton is now talking to six OEMs and main distributors there.

## Small-bank system

BANKING system specialist Arbat has introduced a low-cost microcomputer system for banks with less than 30 staff.

Costing from under £50,000, the system is based on Arbat's "£10 million" TSP award-winning ABS banking system, and handles a wide range of applications including general ledger, turnover, interest accruals, foreign exchange and loans and deposits.

## Harris OS switch

A MAJOR change of operating system has been announced by the Information Systems International Division of super-minicomputer manufacturer Harris Corporation.

Based on the existing Vulcan operating systems, VOS will include enhancements such as additional support for Pascal, Fortran 77 and Cobol 74. Available free to current users without source code, it costs £2,000 with source code.

I. P. Sharp is intent on  
winning over the DPM

by Maggie McLening

AFTER years of skirmishing, it looks as if the hatchet may soon be buried by DP departments and APL suppliers, according to Fred Perkins, director of European operations for I.P. Sharp Associates.

Perkins claims that I.P. Sharp is now talking to the DPM, rather than the erstwhile end-user. The company is intent on breaking through development restrictions traditionally imposed by the DP department.

"Deep down a lot of DPMs only want to run a nice smooth operation by controlling the users, or preferably with no users at all," he commented.

APL is now being forced on them by situations such as the one that exists at a large pharmaceutical company with in-house ICL equipment. The DP department now also houses an IBM 4341 which is run exclusively by the users.

Part of the new ease in selling APL is because the majority of users never see any APL code and are probably unaware that it exists under the English language interface. I.P. Sharp now puts emphasis on solving problems, rather

than buying APL, stressing the flexibility of an APL-based system.

"The area of traditional Fortran/Cobol packages was very good when it first started, but the downfall came because they tried to be all things to all men. Customers would have to change their business and then might well go on to micros," explained Perkins.

"I.P. Sharp started off with very little in the way of packages, but started writing in APL to allow customers to change systems as they went along."

Many large clients of I.P. Sharp's time sharing service have now gone in-house, including Rank Xerox, Citibank, Amdehl and the Wellcome Foundation. Philips has also taken APL in-house in the first of several installations, in which APL users will be provided with a bridge into an IMS database.

Micro APL is another pie in which I.P. Sharp has a finger firmly planted, but Perkins does not altogether approve, commenting, "APL is very powerful, and not really something to be implemented on a 10 cent piece of hardware."



PERKINS... "Deep down a lot of DPMs want no users at all."

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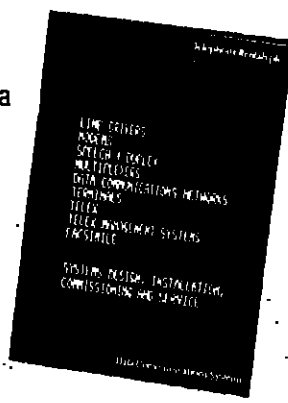
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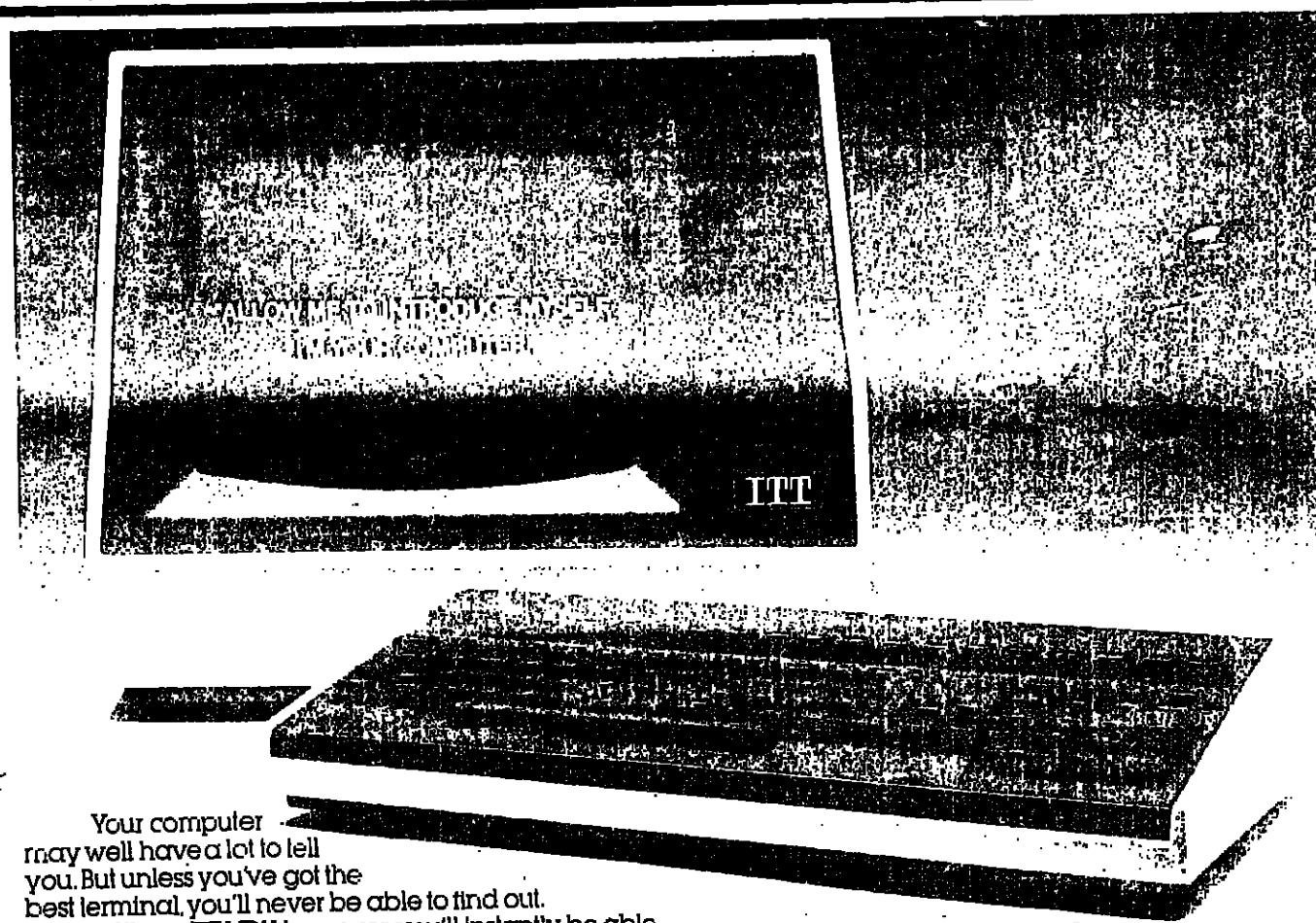
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# Where would we be without life's routines?

WHEN we look for a methodology for systems analysis and design work — a procedural plan is what we mean but it seems that that doesn't sound grand enough — what are we expecting it will bring us as benefits? My own list of expectations includes the following:

- A — A more consistent performance by the analyst from one task occasion to the next
- B — A more standardised form of design and all the advantages that should follow from this
- C — A better understanding of how the problem has been tackled by being able to trace the analysis and design thought processes of the project team.

I know of other claimed benefits, but these three will suffice to remind us that we are talking here about the need for management control. It is hoped to achieve good results without suppressing the kind of personal qualities — skill, intelligence, imagination, craft-knowledge — that might be thought to work better when the analyst is more free of day-to-day control.

## 10 YEARS AGO

From Computer Weekly of May 11, 1972 . . .

TO expand sales and exports of its successful Roadside software and systems, BOAC signed three major marketing and development agreements with IBM, Lenco and Eastern Airlines of the US . . . All schools and colleges in the UK would have free access to a new computer education advisory service set up

by the National Computing Centre . . . European shipments of Hewlett Packard's advanced computer, System 3000, were expected to begin early in 1973 . . . Traffic in Central London became computer controlled as the first phase of a scheme installed by Siemens for the Greater London Council.



Alwyn Jones is senior tutor in business systems analysis at City University in London, and acts as a consultant in the public and private sector.

the latter case is not significantly damaging in itself. I believe that a routine in systems analysis, as in anything else perhaps, does bring the kind of advantages A, B and C are also very real but an intelligent analyst will ensure that they don't overwhelm the benefits. The sharp point to my mind is that much relies upon the actors being willing participants. Not only willing, but believing participants also.

## Much relies upon the actors being willing participants. Not only willing, but believing participants also

procedures of action (many to be used repetitively). If you try to raise the question of psychological health in this connection — the "assembly-line worker" syndrome — you may find you are not on very safe ground. A recent radio broadcast enabled Dr Donald Broadbent of the Department of Experimental Psychology to make the point that according to quite respectable research short tasks repeated frequently seem to be no more damaging to psychiatric health than longer tasks repeated less often. There was an implication that

## HUMAN TOUCH

# Ensuring power for the people

WE like to think of data as whatever it is that was recorded to show that an "event" has happened. The event may be that an individual's employment has terminated or he has worked 40 hours this week. In this concept it becomes possible to separate from whatever is recorded what we call indicative data apart from the actual data itself.

The indicative data shows what the actual data is and, for our payroll example, which employee it applies to. We can call the balance of what is recorded actual data for want of a better name. For the termination example the leaving data is implied by the indicative data and therefore not strictly speaking necessary. That the fact of the implication of leaving data is in the indicative data will be clear if it is realised that the indicative could have meant "employment continuity" (started, suspended, stopped) with something other than an "S" in each case as actual data. The 40 hours is a much more normal case of how we think of data.

Now data firstly occurs in the real world outside of any computer. We have been inclined to the view that all data occurs in the human brain, but that requires some other word to be found for the signals in a computerised control loop.

Today humans have to initiate the recording process and on first occurrence the method used is still mostly pencil and paper. Not quite the forefront of information technology the computer is supposed to be.

Going back to what we call data, it will be realised that the indicative data is much more predictable than the actual data. For one thing the indicative data has to be acceptable to the validations of the computer system. As far as the



Cliff Dillaway is an independent consultant specialising in accounting software, taxation and payroll.

computer is concerned the only things that can happen are those where the indicative data is able to pass validation checks. That brings us to the turnaround document and the theme of this column. The computer can produce a document on which the human may record the data when it occurs in his or her brain. The computer prints out the predictable indicative part while the human supplies the actual data when it occurs. A tick in a box will often suffice and be a lot more accurate as a result.

For payroll time recording sheets produced by the computer are often used. The hours, etc, are written on the sheets which are then used for computer input. The computer displays a layout similar to the turnaround document in the same employee sequence and the data is keyed in.

The same principle can be followed even if no written record exists prior to computer entry although we have doubts about the auditability of such a system.

It should always be possible to check back to find the authority for the computer entry. The manual recording of data and its formal authorisation may be cumbersome but it does ensure that humans remain in control.

Cliff Dillaway

## FOCUS

# Writing on the DP walls

DP managers by now should have become resigned to being declared down and very much out. "Focal DPMA restrict effective use of computers", "DP managers regarded as a handicap", "The role of the DPMA is over", "DPMA declared dead" are typical comments being expressed both inside and outside the computer industry.

Although DPMA have had considerable time to study the writing on the installation walls, few have heeded the warnings, preferring to hope that the business, micro, local area networks, videotex technology and the company size director will go away.

Unfortunately for the DPMA, such hopes have been built on a wishful thinking package. Far from disappearing like a passing salesman one minute after the contract has been signed, the micro, along with office automation, robots and information technology, seems here to stay. Alongside distributed processing developments, the DP team will be distributed into the local recruitment agency.

At least the DP manager cannot complain that he was not warned. As long ago as January 1981, George Penney of the NCC was writing in Computer Weekly the only programmers and system analysts, plus some operations personnel could expect to remain unscathed by the coming revolution. Barely two years later, now those survival areas are under threat.

User friendly operating systems are replacing the often too friendly operator while ready-made "off-the-shelf" application packages are releasing the programming development team of much stress, strain — and work.

Right now the threat may appear as only a small black cloud on the horizon. But storm clouds in the shape of 16-bit microcomputers are building up to challenge not only Apples and Pcs, but the whole structure of DP installations.

Users are discovering that they can achieve personal hands-on experience without having the heavy hand of the DP team involved. The growth of micro networking systems could represent the DP breaking point, eliminating the need for an expensive central computing services section. Even without a mainframe approach remains in service, it is by no means certain that an independent DP team is seen as the revolution.

As a result of computing power games, responsibility is moving away from the DP department into user operations sections. John Fuller, managing director of systems house PCML, has few doubts that the DPMA not only has to mend his ways, but seek new career pathways. Speaking in London, he compared the two years it had once taken a company to get a basic DP accounting package up and running to the two days involved in getting a micro package running.

As users become increasingly independent, he believes that the next step will be a concentrated challenge to DP, budgets, with many users keen to channel funds away from the DP operation. The DP department, it seems, has been DP department on all fronts. But come vulnerable to the challenge is growing. Users are getting the message, but it is still the DP team who are expected to get them out of trouble.

Factors for DP survival are the creation of corporate databases linking all company information, strands and technology. IT may be the theme of 1982. For many DP teams, IT Year could be the time when they can report that they are IT coming and responsible accordingly.

Alan Simpson

# ComputerWeekly

Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS

Thursday, May 13, 1982

# When IBM fails everyone loses

THE world has moved on a turn or two since Frank Carey allegedly ordered an investigation into why IBM had failed to produce a machine as powerful as the Cray 1.

But not much has changed, at IBM anyhow. If John R. Opel, IBM's current president, has not now asked his senior executives why three Japanese companies and two American companies can build faster machines than IBM, and more cheaply, he should have.

It is a sad comment on a company of IBM's size and resources when a customer looks for first-class service on his site by ordering a giant Japanese machine instead of an IBM 3081.

This has occurred on one of the biggest mixed sites in Germany, with two 3081s and now, two Siemens 7.880s, in other words Fujitsu machines.

The customer did not feel he was getting bad service from IBM. He just wasn't getting first-class response and priority on his peripheral orders. And he can't be alone.

□ □ □ □

The sudden rise in the announced deliveries from Fujitsu to Siemens of IBM compatible machines, from about two machines a month in spring last year, to eight or nine per month recently, means that in Germany IBM is suffering real inroads to its user base.

But customer service is less of a problem than that which prevents IBM from retaining a technical lead with its top mainframes.

IBM is so big that it absorbs about 70% of all the electronic design talent in the US. In the end that talent must subscribe to and finally accept the committee decisions of the top men at Ma Blue.

Those decisions have kept the corporation at an effective standstill in terms of real, post inflation, growth in the marketplace. They have also buried or abandoned God knows how many good concepts and designs, in order to produce top end machines which are not of the same ingenuity, speed or excellence as their midrange competitors.

But if IBM's failure to grow in real terms, a failure clearly spelled out in the company's own annual report, has cost IBM dearly, what is the cost to the world?

A good deal more has to be the short answer. IBM has more bright engineers than all the competition put together but at the top end recently, IBM has somehow managed to produce machines that would indicate a degree of mediocrity somewhere inside the corporation. Indeed, to look at IBM's finances over the past four years might produce the same conclusion. In parallel with over-caution in terms of products produced, the company has eaten into its cash reserves and failed to raise its dividends.

□ □ □ □

There is a real growth in the sector in which IBM operates — its own Japanese subsidiary clearly proves that point, as do the many smaller companies operating in the IBM marketplace. There are also wide possibilities for new designs and machine architectures.

Gene Amdahl has proved that again and again. So have the designers at Hitachi, Fujitsu and NAS.

But the cost is high and most of the resources needed are trapped inside one company, IBM.

It would hardly be fair to expect IBM to produce alternatives to its own top end, but neither is it fair to continue to tread the safe path of no growth by producing machines which are less than the very best there is.

When IBM fails to do its best, everyone is the loser.

## 1984 and all that . . .

THIS week's example of the strange things people say about computers was sent in by Rory Johnston of London, who wins £5. An interesting thing is that Pips is a concept of the right side of the brain, and reflects the Eastern concept of Buddhism and Indian philosophy. Visually, on the other hand, is a concept of the left side of the brain. The two are quite different. For example, Pips has a zero unit. Every computer has 13 or 15 units — with a certain number of units in each row or column. With other computers this number is always one or more. However, with Pips there is a zero unit. Working from nothing to something, or from something to nothing, Pips incorporates a concept from Mahayana Buddhism.

## LETTERS

# Operators need a union

A UNION for operators has been discussed in the past in Op Spot. The continual change and expansion of our industry may necessitate further debate. Here is an outline of my thoughts on the subject. I have nine years' experience in operations and am at present a shift leader.

In the past few years we have experienced a substantial increase in the use of database, teleprocessing and time sharing facilities in answer to users' requirements for improved information systems. Hardware is becoming cheaper and upgrades more regular. The operator must accept these changes and the increase in workload and achieve a higher throughput rate for the user and department, often without financial reward from his DPM. Is this a fair arrangement?

The importance of computer operators is paramount to an organisation employing DP — if the operator withdraws his labour, chaos reigns. Often both management and unions fail to understand the individualistic, self-motivated

operator who works unsocial hours, has responsibility without authority and is situated in a remote location.

An operators' union, however, would lack expertise, financial backing, recognition and is totally impractical. The computer operator should be in a well-established union which can offer security and experience. He ought to attend union meetings and know his representative or steward; the union machinery ought to be observed. Informal discussions with important union members should ensure the union is aware of the operator's aspirations.

If you, the operator feel you have a problem it ought to be discussed at a meeting with the DPM, ops manager, shift leader and other interested parties. If it is not resolved at the meeting, inform your DPM that you will ask your union to advise. Do not become involved in arguments with your manager. Your union should solve the dispute.

PAUL LEESE  
Bradford, Yorkshire.

# UK Girobank troubles

I WAS surprised and mildly dismayed to read your lead story on industrial troubles at the UK Girobank (CW, April 29).

I take the opportunity to confirm our posture as being akin to that of other Girobank maintenance suppliers as reported by you. We will continue to furnish our usual impeccable maintenance service for such time as we are contracted so to do. Thereafter, we would hope to maintain this relationship on any commercial matters.

Whereas your article is substantially correct I would point out that there is no question of "the transfer of engineers" to a third party. Our engineering staff are guided by their own independent motives and, as I understand the situation, are without exception aligned against any transfer to a third party maintenance company — an attitude which has hardened as a result of some fairly crude attempts to unsettle them in their employment security.

This brings me to the topic of your article — that of industrial action at Girobank. Although overseas at the time, I understand that this was the predictable result of interference with our own discharge of the contract for the purpose of educating our successors. Although I do not condone this unfortunate incident, it is scarcely surprising that staff object to aiding competitors effectively to put them out of business.

Accordingly it might be of more general interest to your readers were you to disregard the specifics at Giro — a normally well-run site — and analyse the viability of this party maintenance of equipment that is slightly outside the main stream. From our current experience there is a considerable reliance on plagiarising the assets and expertise of the sitting tenant in order to offer a cheaper deal. How say you?

A. M. ASKEW  
Managing director  
Lundy Farrington Ltd  
Portsmouth, Hants.

# VAX impact on the PDP-11

FURTHER to your front page article (CW, April 22) on the VAX 11/730, a number of points need clarification.

The VAX 11/730 is a good machine bringing 32-bit power to a far greater spectrum of users. The impact on the PDP-11 product range will be, for at least a year, minimal, as there are a limited number of commercial packages available on the VAX. Analysing the PDP-11 product range gives a range of products designed to meet specific market areas. Although in real terms, if any PDP-11 process-

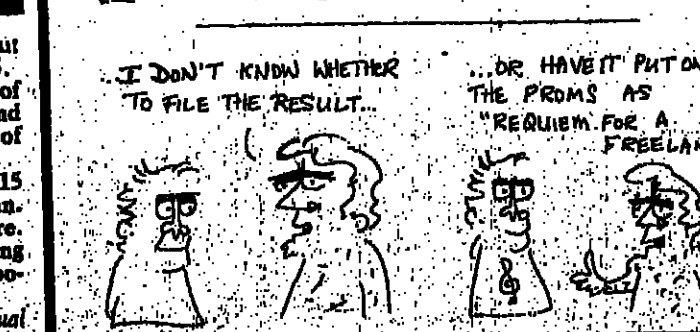
or was to be phased out it would be the PDP-11/70, leaving the 11/24, 34 and 44.

My comments, quoted in the article, on the memory limitations of the VAX 11/750 are only too true, consequently we are currently selling VAX 11/750 systems with up to eight Mbytes of memory (using 64K RAM) and an enhanced processor.

MARK WOOLFSON  
Technical consultant  
Systime,  
Leeds.

# Cineaware File

MY ACCOUNTANT, FED LAST YEAR'S FIGURES. . . TO A SYNTHESIZER INSTEAD OF THE USUAL TAX SYSTEM. . .



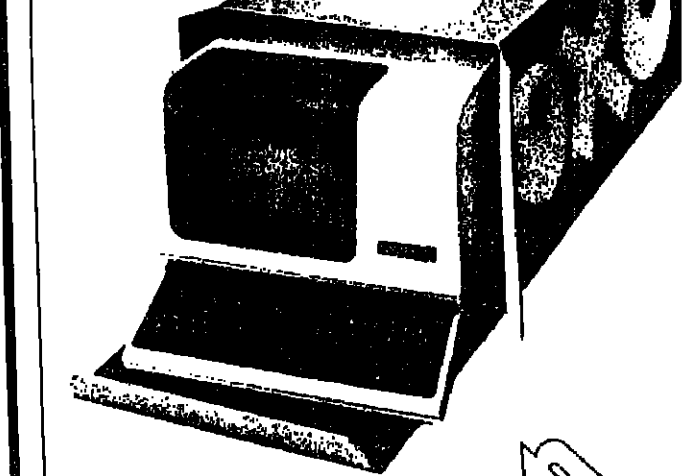
# Approval of CP/Maker

IT may be quite true that Commodore makes no secret of the fact that the one common factor to all the products in its "approved" catalogue, is the supplier's willingness to pay Commodore a royalty.

GUY KEWNEY  
London N4.

The Editor welcomes letters commenting on subjects published in Computer Weekly, or on original topics.

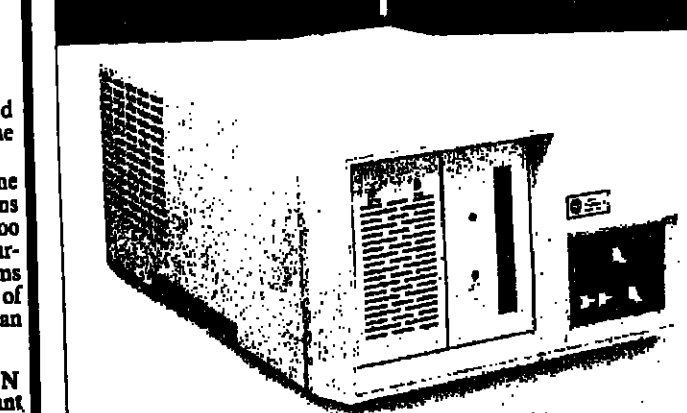
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## DOWNTIME

# Think of a number . . .

IT would appear that the Argentinians are not as backward in the use of computer technology as British intelligence would have us believe. Evidence from South America seems to indicate that computers are indeed in use by the military junta.

Claims for losses inflicted on the British task force are broadcast from Buenos Aires. To date, the figures quoted imply that the number of Harrier fighters shot down now exceeds the total production run, let alone the few sent

to the South Atlantic. Surely no human would make such claims? No, Chad believes that we are evidencing the military equivalent of the Emillion gas bill, produced by some inadequately-programmed machine situated deep in the bowels of the Argentinian Ministry of Propaganda.

Let's hope the conflict is over before they move on to the next stage, too horrific even to contemplate — the setting up of an Argentinian Driver and Vehicle Licensing Centre.



# Gourmets corner

MY postbag contained a bizarre item this week — a challenge from a robot in an eating competition. The race would be over a dozen raw eggs, to be consumed without spillage of yolk, or spilling of the shell. In other words, the shell would have to be carefully pierced with a pin, and its contents carefully sucked out.

The robot may find it is biting off more than it can chew. Chad is no slouch when faced with intrac-table foods. Among his eating achievements is the consumption within the minute of an entire walnut, shell and all. For this feat he earned £2 from a captive audience, only to spend £5 a week later at the dentist. Fortune forsakes the wild.

Chad

# Signs of The Times

THOSE who closely scrutinise the columns of our most august daily newspaper will have noticed teething troubles with its new computerised photo type-setting. Recent editions have been liberally bespattered with misspellings and words misplaced or omitted.

At least I hope the new technology is to blame for the sudden fall of standards, and that Times journalists have not caught a sudden bout of dyslexia from their brothers at the Granadad.

# Foul habits

FOLLOWING an unfortunate incident on the streets of Sutton at which I was the wounded witness, I exhort the relevant authorities to extend the by-laws prohibiting fouling of pavements to include babies as well as dogs.

# Shocks in the office

I AM shocked by the failure of ergonomists to solve the problem of static electricity build-up on office furniture. In the past week I have received electric shocks from three sources: Computer Weekly stationery cupboard, my typewriter and even the cufflinks of a colleague who brushed past me in the confined entrance to the loo.

# It figures

LOW Home Office figures for computer crime have in the past provided fodder to those who argue it is of minor significance and not worthy of great consideration. Not any more. No one had noticed, or cared to notice, that the low figures were the result of an omission from the Crime Reporting Form used by the police. There was no box marked "computer".





LEFT: the people controlling this train are 40 miles away.

RIGHT: Certainly the best train set I've seen - inside Kings Cross signalbox

## The ops who keep track of 1,220 trains a day . . .

WHEN you were at school what did you want to be when you grew up? Not a computer operator, I'll bet. If you are male, chances are you wanted to drive a massive, clanking, steaming machine. No, not an IBM water-cooled mainframe, a steam engine.

Just as steam engines, lovely though they be, have given way to sophisticated vehicles such as the electric High Speed Train being developed for the Euston to Glasgow run, old semaphore signals have been replaced by more up-to-date methods of regulating trains.

The Great Northern suburban network links Kings Cross and Moorgate in London to Peterbo-

rough and Cambridge, and has 35 stations. When built, there were 57 signal boxes to control the 80 or so route miles, involving more than 260 actual track miles as a result of having four or more parallel tracks, sidings and so on.

When the network was electrified, all 57 manual signal boxes were replaced by one computer-assisted box at Kings Cross, which became fully operational in 1977. The area covered runs from Kings Cross and Moorgate to Sandy in Bedfordshire on the East coast main line (the Edinburgh one), and Royston in Hertfordshire on the Cambridge branch, including the Hertford loop line.

The signalbox is housed in a three-storey building (on the right as you leave Kings Cross, immediately before the first tunnel) which also contains a telecommunications centre. In the control room, the movements of 1,220 trains are monitored simultaneously on the 80-foot long horseshoe-shaped control panel.

Thirty-eight signalmen operate the signalbox on a three-shift system, setting points and signals on long stretches of track by pushing buttons on the diagrammatic plan of the railway. If the line is clear, the relevant points will be

set to the required position, and when all safety precautions are met, the signals will change to green to allow the train to proceed.

On many stretches of the line, each train follows the same route as the preceding one, and to avoid the signalman having to set up an identical route for each train, the

signals work automatically. As a train passes a signal, it changes to red, preventing the next train from following too closely.

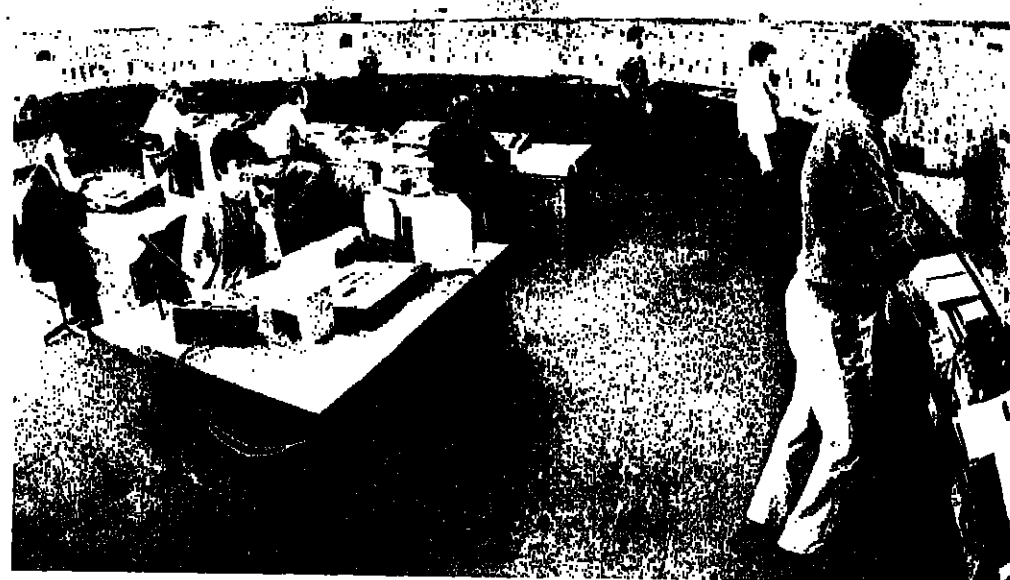
As the next signal down the line is passed, the first signal changes to amber, allowing the following train to pass with caution. When the third signal is reached, the first signal changes to double amber, and as the fourth signal is passed, the first one changes back to green.

Thus trains can run at 125 mph, under automatic control, separated by a total of four signals - well over the braking distance needed to stop an HST from its maximum speed.

In order that each train can be identified at a glance, they are depicted by coloured lights on the track plan. At strategic points on the diagram, displays show the identity of each train - the type of train (fast, slow, or goods), the route, and the train's number in the timetable.

The train identities are fed into the system at London before they leave, and Hewlett-Packard minis track the trains along the system as they move. Train identities are passed to the next signalbox down the line, at Peterborough, where a similar installation takes over the monitoring of traffic. The identities of London-bound trains are passed to the Kings Cross box from the Peterborough box in a similar manner.

by Andrew Thomas



Another automatic feature of the installation is the signalling of trains in the Moorgate area. As a train approaches the station, it is automatically routed into a vacant platform. When a train is ready to leave, the station staff push a "train ready" button, and the system selects the correct route.

Should the Kings Cross box fail for any reason, there are emergency control panels along the track, each governing a smaller section of railway, which enable normal running to continue until such time as Kings Cross comes back online.

Other functions controlled from the Kings Cross box include station announcements, not just for the London terminus, but for any of the other stations on the network.

In addition, there are train destination indicators on most stations, which show the stations at which the next train will call, using information from the train identity code.

This type of signalbox, of which Kings Cross was the first to be commissioned, is being installed at various locations throughout the BR network, the latest to open being the new Clapham Junction box, controlling a large section of the Southern Region commuter network.

Next week, Op Spot goes underground.

## PROGRAMMERS PAGE

### Check Mate for Apple

THERE is now no shortage of chess programs for the well-known microcomputers. For example, a chess cassette for the Sinclair is priced at about £7.

At the opposite end of the price spectrum, a chess system has just been released for the Apple II for about £300 by London-based Database. Called Mate, this is a deluxe system with a real chess board and real pieces whose moves are communicated to the computer by means of magnetic sensors.

Indicated by LED lights on the appropriate squares of the board is Mate's reply, which is also displayed with the whole board on the computer's screen.

To launch Mate, Database issued an open challenge at the Baris Court Computer Fair. The score: 74 to the computer with two draws.

A spokesman for Database explains that the level used was the lower of two tournament levels which take into account the time factor. In other words one is never quite sure to what standard the computer is playing at any time - although that is also true of human opponents.

What I am waiting for is robot



At odds with Mate . . . Crispin Bates, 15.

chess. A Swedish company has a robot which it claims can play chess, although the contraption more resembles the travelling gantry crane which can be made with Meccano. As clumsy too - it contrives to knock the pieces around like skittles as its arm sinks ponderously on the board.

I conclude that we still have long to wait for a civilised game of chess across the coffee table with a robot. Meanwhile we must content ourselves with the likes of Mate, which at least saves the irksome burden of decoding the jargon of chess magazines (e4-e7! that sort of thing) before making a move.

## Trespassers will be exploded!

AN alarming turn of events for burglars and prowling poltergeists has sprung from research in electronic warfare conducted by the Israeli government.

This threat to trespassers is a system which, when alerted, will telephone the proprietor of the premises, who can then talk back to the alarm to trigger suitable action.

A siren could be activated for example - or a canister of nerve

gas could even be exploded.

Any event capable of encoding into the telephone can be detected, so the system will serve as a fire alarm, or as a timely warning to fetch in the washing.

The system was designed by Ilan Haran, formerly of the Israeli government, and has already been implemented, in its jumbo form, in 500 branches of an Israeli bank.

The small form, consisting of a portable encoder, would be ideal

for a corner shop, Haran tells me.

The system will normally be used in its listening capacity with acoustic detectors linked up to telephones. "This relies on an algorithm which cuts out stray and repetitive noises," says Haran.

The larger version of the system is based on the Elvett Daisy computer, with a program to interpret the alarm signals as they come in from one of many branches, and in some cases to fix the response.

## Shelling out too much for modems?

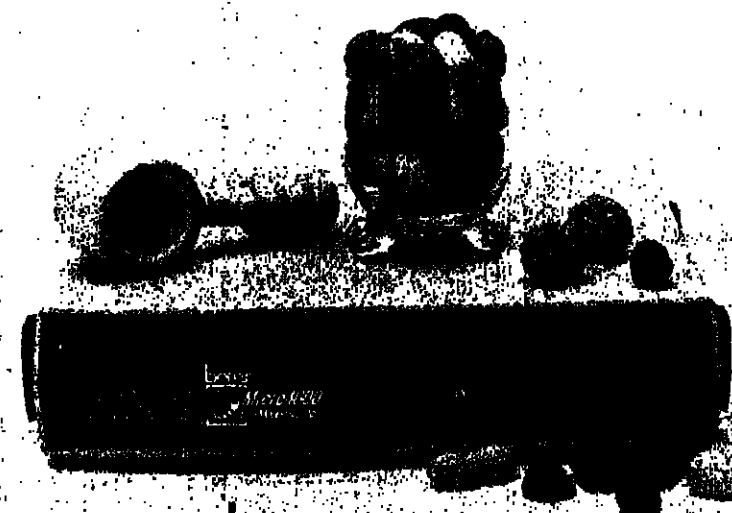
You may be spending more now on telephone lines than you ever have before, but if you're wise, you'll be spending less on modems. New low price standards have just been set by Microm-Borer's new Micro4000s - thanks to mailer and more powerful single-board designs using higher level integration.

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## New languages could make Ada obsolete says European survey

COBOL is here to stay - until our schoolchildren grow up. That is the stark finding of survey of the consultancy and software services market in Europe conducted by CMG Computer Management Group.

Packages will be the biggest growth area in the software industry, which will increasingly be relied upon by the computer manufacturers for window dressing application programs.

And there will be more collaboration between software houses with government encouragement for joint ventures, mergers and acquisitions to create large companies competitive in world markets.

The survey also finds that demand for packages will outstrip that for bespoke software, even in specific industries.

Here we must be clear that the line between bespoke and package is vague and blurry. Bespoke software will often include modules available as packages, and a system developed for one company on a bespoke basis might later be sold to others in a packaged form.

This is the case with British Petroleum, which markets software developed internally to other oil companies through its subsidiary Scicom. There will be more of this in the future, according to the survey, with bespoke development more confined to new, unforeseen applications.

The most contentious finding of the CMG survey concerns Ada, which it believes is not likely to become commonly used in the next five years. After that new languages will be developed which will render Ada obsolete, at least among the business community, as new ideas come in from the present generation of computer-crazed schoolchildren.

This interpretation of the survey is hotly disputed by leading Ada authority John Barnes of SPL, who finds this faith in our schoolchildren extraordinary.



BARNES . . . "Teachers are just passing on information on Basic from manuals."

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This interpretation of the survey is hotly disputed by leading Ada authority John Barnes of SPL, who finds this faith in our schoolchildren extraordinary.

"They are being taught in junk anyway, so they will never have any impact at all," is his initial response on hearing the assertion.

"Teachers are just passing on information on Basic from manuals," he says.

Barnes goes on to say that a skeletal course in Basic is fine for arts pupils in order that they may have a flavour of computing. But children going into science should be taught maths and learn nothing directly about programming at first.

"Children are taught New Maths at school with set theory," he says. The set theory should be built on in computer science, using a language like Pascal.

Barnes thinks that the style of Ada may not directly appeal to business users, but he sees no reason why it should not take over in process control applications and in defence.

Indeed it is already doing so with CAP Reading, for example, doing research with robots controlled by programs written in Ada.

## PUZZLER

I HAVE before me four three-digit cash register amounts that add up to £7.11. Strangely enough, when multiplied together they produce the same £7.11 total.

One of the amounts is £3.16. Can you work out the other three? See page 55 for solution.

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Atlantic's Annual Report and Accounts are available on application to the Company Secretary.

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## Nothing ventured....

HERE'S the solution to the latest batch of Adventure problems. Your response has once again been gratifying, indicating that this is a subject dear to your hearts - and which takes up a good deal of your time.

I'd be interested to know what attitude your site takes to game playing and writing - is it frowned upon, or allowed on the grounds that it can often spawn technical innovation and develop interest in programming techniques?

### More hints

OTHER handy hints received this week include: After throwing the eggs at the troll, cross the bridge and pick up the spices, bear and chain. Use the bear to scare the troll on the way back, but don't take it across the bridge with you. (Steve Campbell)

The trident (no relation to cruise) is used to open the clam, revealing the pearl, and the way to obtain the Persian rug is to hit the dragon. (The Dwarf, following my remark about his parents two weeks ago, now informs me that dwarves don't have them, they simply appear in a cloud of greasy black smoke.)

Thanks also to everyone else who submitted solutions, not least The Giant from Salford, John Perry and Andy Kennedy who phoned in the answers. They point out that the magic words must be

### ADVENTURE

spoken one at a time in order to have any effect.

It appears that there is yet another Adventure derivative in use (how many are there for heaven's sake?), written in PL/I and incorporating a lot more features, rejoicing in the name of Bilbo.

I wonder where they got the idea from?

### Answers

SIR, It's your friendly dungeon master again, with the answers to the Adventure and Dungeons problems. Michael Slattery should give the golden eggs to the troll, then retrieve them by saying FIB FIB FOE FOO (dead easy really).

Rob Cottrell's problem is a lot harder. The egg is the only treasure hidden outside the cave, so naturally it must be taken inside the cave first. The thief must be allowed to steal it from you and take it back to his lair.

If you then manage to kill the thief, you will find that he has opened the egg using his superior knowledge. This is not the end of knowledge, as he will then face the endgame with 100 more points to find.

I wish him luck - it's pretty vicious. GROFF RICHARDS Sutton, Surrey



## The protection debate is given a wider context

The Politics of Secrecy, James Michael, Penguin Books, £2.50.

THIS book is about the attitude of successive British governments to information, its use and dissemination. It deals on one hand with the government's refusal to allow freedom of information, or access to government information, and with the lack of privacy or data protection legislation, on the other.

It gives a thorough and extensive coverage of the issues underlying the whole secrecy debate — the right to know — and is essential reading for anyone interested in this significant debate.

Its one deficiency is that it only devotes one chapter to data protection and computers. This gives a fairly thorough treatment to the Lindop Committee report on privacy, but does not mention subsequent work in this area, like the Council of Europe convention on data protection, of which the UK is one of the signatories.

It does discuss the Police National Computer, though even

this has been overshadowed by a Scottish research group's report on The Police Use of Computers, published at the end of March.

The debate about data protection has tended to be conducted in isolation and this book performs the useful function of putting the whole thing into the context of the much wider debate of open government.

Successive British governments have, it seems, a fatal addiction to refusing to disclose information about the safety aspects of British products, even when this information is publicly available in the United States, because of the US Freedom of Information Act.

The book amply covers the machinery through which the government maintains its monopoly of information; the layer upon layer of informal rules and Acts of Parliament, topped by the Official Secrets Act. Most alarming is the arbitrary and inconsistent way in which this Act has been applied.

From the discussion, it would

seem that any data protection legislation would have to be allied with a change in the Official Secrets Act, either concurrently or retrospectively, which itself would probably be tied to a move towards more open government.

Government must become more open — the wide-ranging, catch-all, Section 2 of the Official Secrets Act makes it almost impossible for information to become more restricted.

Much of the information in the book is already known, though this is the first time, to my knowledge, that it has been drawn together in this useful and comprehensive way.

What is perhaps surprising is that James Michael is an American lawyer, though he has been resident in the UK for about 10 years. He has worked for the American safety campaigner Ralph Nader and is currently a senior law lecturer at the Polytechnic of Central London.

Kevan Pearson

## OS complexity forces compromise

Operating Systems Elements — a User Perspective, Peter Callinagert, Prentice-Hall, £17.95.

THE complexities of operating systems make them a difficult subject to write about. If an author wants to give practical and in-depth coverage to the subject, he will be tempted to concentrate on one manufacturer's approach and to look at that manufacturer's operating system evolutionary path.

The problem here is that only the large manufacturers such as IBM, ICL or Digital Equipment get coverage if the book is to find a large enough readership, although lesser-known operating systems may be more elegant.

If, on the other hand, the author

wants to remain independent from any single manufacturer, his quest for common ground may lead him away from in-depth coverage and to a compromise coverage of the lowest common denominator in operating systems.

Operating Systems Elements falls in the latter camp. The book is written primarily for third- and fourth-year undergraduate students. The readers are assumed to have some experience in assembly language programming and to be capable of reading short programs in an Algol-like notation.

It is intended for people studying the control programs of an operating system, of whom relatively few will ultimately design and implement an operating system. Only a somewhat larger

number will modify a control program, but virtually all will use the facilities provided by operating systems, says the author.

"The book makes a single pass over operating systems, at a level intended to be neither trivial nor deep. Principles take priority over engineering details, and complex implementations are not discussed. A few algorithms are expressed in a standard Pascal, PL/I, or Algol program," the preface reads.

Callinagert attempts to use terminology which he believes will not be misleading while at the same time being universally acceptable.

Boris Sedacca

## Buyer's guide leaves out Sinclair

The Home Computer Handbook, Frank Herbert with Max Barnard, Victor Gollancz Ltd, Price £7.95.

IT is doubtful whether this book is of much value. It contains many assertions on the motivation of computer professionals on such matters as artificial intelligence and many other areas which

demonstrate that the author's knowledge of the subject is at best superficial.

It is also unlikely that many people, without access to a computer, will learn programming from a book using an artificial language. It is about as likely as someone who has never seen a piano and has no access to one, learning to play

from a poorly written book.

The book claims to contain a buyer's guide to personal computers but does not mention Sinclair. It would seem to have got it all wrong.

Philip Rule

Chairman of software house S&J Computing.

## Mail service planner contains some pearls

Planning for Electronic Mail, Compiled and edited by Alan Simpson, Gower Publishing Company, Price £9.50.

READING this book will give a strange sensation of déjà vu to anyone who has read Planning for the Electronic Office, the first of the Office of the Future series. Although the contributing authors are different, much of the text seems the same and a spurious section on the history of word processing has even been allowed to sneak in, under the justification that it is "a likely contender for generating the mail".

There are, however, several pearls among the articles, which would be of practical value to someone preparing the ground for setting up an electronic mail service. Fred Perkins of I. P. Sharp Associates claims that an electronic mail system has been in use as part of the company's worldwide time sharing service for the last ten years, and his detailed knowledge of the subject seems to bear him out.

Detailed advice on the planning side is given in the first chapter by

Alan Thompson of ICFC Consultants, with yardsticks to help evaluate the benefits of introducing this type of system. He suggests that the entire cycle of mail processing, and therefore current deadlines, within the office environment would be altered by electronic mail; something which many users might only discover the hard way.

An optimistic section on the future of Prestel, by Graham McMorris, was presumably written before British Telecom announced 90% price cuts in its depreciation to get the system more widely used. His cheerful catalogue of the improvements scheduled for Prestel left me with a sinking feeling: does this mean that British Telecom's charges will have to rise yet again to pay for all this?

The advantages and disadvantages of facsimile machines are another area simply covered within the book, and A. St. F. X. Gernard of ITT Business Systems gives a useful cost comparison chart between fax and telex services.

Maggie McLening

## Basic principles of microprogramming

Elements of Microprogramming, D. K. Banerji and J. Raymond, Prentice-Hall, 1982, £18.75.

INTENDED to provide a comprehensive coverage of basic principles, practices and applications of microprogramming, this book adequately fulfils its aim. It derives from a course on microprogramming and machine architecture but should be of interest to a far wider audience, although as the authors rightly point out microprogramming should not be confused with the programming of microprocessors.

Readers are assumed to have a background knowledge of machine organisation and assembly language programming. With this base the first of the five parts of the book covers basic, historical evolution and essential computer organisation in three chapters, thus providing a valuable introduction to the field and a sound foundation for the book as a whole.

The second part of the text discusses microprogramming hardware and microinstructions in a detailed but readable way and includes design considerations.

Part Three devotes its three chapters to microprogramming practice, covering the development of microprograms, implementation of instructions and function, and performance and optimisation.

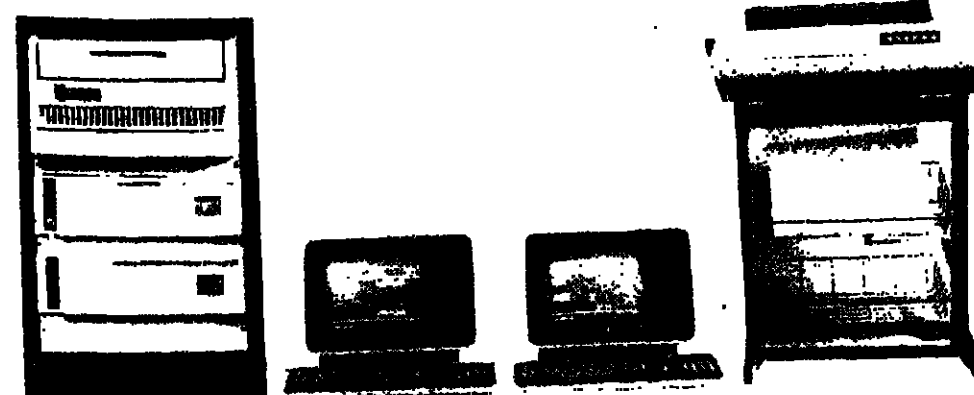
Microprogramming applications are featured in part four and applications in emulation, operating systems and high-level languages are well catered for.

The final part discusses examples including microprogrammable microprocessors and, interestingly, top-down microprogramming at machine level.

Tony Ponsell

Head of Computing and Mathematical Sciences, Wolverhampton Polytechnic.

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## Industry training board names head

THE Engineering Industry Training Board, responsible for training in the computer manufacturing industry, has appointed Ronald Stevenson as director to replace Joe Moon. Moon retired last year because of ill-health. Stevenson has been on the board since 1965, and head of corporate planning since 1976. He is a chartered engineer and a Fellow of the Institute of Mechanical Engineers. Operating costs of the board, previously met by the government, are now being paid by engineering employers. The employers are now insisting that the next chairman should come from the employers' side. The term of appointment of current chairman Lord Seaton, who has also been acting as chief executive, expires this July.

## DP squash tournament

SQUASH fans are being given an opportunity to show off their skills and win a share of the £1,000 prize money offered by Carter-Parratt in the 1983 Wright Line Squash Tournament. The winning company will also be presented with a £500 voucher for the computer documentation filing system Docu-Mate from the Wright Line range. Entry is limited to 512 teams, and early rounds will be drawn on a regional basis to minimise travelling. One team per company per location will be accepted. Rounds will be played throughout the year culminating in the semi-finals and finals at the Lamb's Club in London on December 3 and 4, 1983. First round starts in January, but Carter-Parratt advises competitors to apply as soon as possible. Entry forms and details from 1983 Wright Line Squash Tournament, SP&M Ltd, Penthouse Suite, Turiff Building, Great West Road, Brentford, Middx.



Dick Rayner (left) and Ken Watanabe have been named joint managing directors of Casio Electronics. Rayner, who has been with the company since its formation in the UK in 1975, controls sales, marketing and general management across all product groups. He started as sales manager. Watanabe joined Casio about a year ago as director of co-ordination and planning. His new responsibilities lie in finance, and production.

## Four new directors at SPH

FOLLOWING the re-organisation at SPH, Systems Programming Holding, the holding company, has made four new board appointments from Western Broadcasting Company, holder of 60% of SPH. They are Frank A. Griffiths, chairman of Western Broadcasting, Frank W. Griffiths, Ray Peters and David Owen, all directors of Western Broadcasting. Acting chairman is Robin Gill, who is chairman of Standard Industrial Trust. Managing director is Peter Adams, former chairman and MD who remains chairman and managing director of SPH. David Rodway becomes director responsible for UK operations and Michael Wale continues as secretary and financial director. The British Technology Group, which owns a 40% interest in SPH, has not yet nominated its representatives to the board.

■ Fred Klerks and Mike Lacey have joined Eosys as senior consultants to work on the CCTA telecommunications strategy study and the DoI/British Telecom Joint Research Programme. Klerks was previously with Citibank and Lacey was previously with CAP.

■ Chris Scottford is sales manager at Micro Peripherals' European subsidiary MPF Europe, based in Berkshire. He was formerly a sales executive with Perlec. Alan King, previously Perlec's service manager, becomes technical support manager for the company.

■ Ted Barker and Rodney Drew have been appointed to the board of ICPC Consultants. They are both managing consultants.

■ Hugh Morris has joined Kennedy as sales engineer. He has been with the company since 1979 as service and training manager.

■ Ken Trueman has been appointed director at RTZ Computer Services. He joined the company five years ago as salesman for the Fasia system, becoming product manager, then sales manager for Fascia and GL Plus. He was previously with Baric and ACT.

## DIARY

**MAY 17**  
Recent developments in cryptography by Dr Donald Davies of the National Physical Laboratory. BCS Technology of Software Protection Group. BCS Headquarters, Mansfield Street, London. 6.30. Details Simon Elsom (021) 3599 3661 ext 735.

**MAY 19**  
Ron Adam from British Telecom on the first year's experience running SwitchStream 1 packet switched service. BCS Data Commms Specialist Group. BCS Headquarters. 6.00. Details Peter Radford on 01-636 5440 ext 205.

**MAY 20**  
AGM and computer archive films. BCS Coventry branch. Physics Lecture Theatre, University of Warwick, Gibber Hill Road, Coventry. 7.30.  
AGM, BCS South Essex branch. Access Sports and Social Centre, Eastern Avenue, Southend-on-Sea. 7.45.

AGM followed by 1982 - Information Technology Year by D Firnberg, deputy president, BCS.

## CONFERENCES

■ THE Yankee Group is aiming to assess and analyse the Japanese high technology industries in its Focus: Japan conference to be held on May 24 and 25 at the Sheraton Hotel in Brussels. The semiconductor, telecommunications and information processing industries will be examined to determine their future role and impact on user and vendor industries. The conference will look at Japan's strengths and weaknesses and the market potential for Western companies in the Japanese marketplace. Fee is £295. Further information from Pat Jackson, The Yankee Group, Regal House, Lower Road, Chorleywood, Rickmansworth, Herts. WD3 5LQ. Tel: Chorleywood 4119.

■ THE Third International Conference and Exhibition on Engineering Software will focus on the use and application of computers in engineering. Organized by the Computational Mechanics Centre, it will be held from April 11-13 next year at Imperial College, London. The conference aims to provide a state of the art review and discussion of recent advances in the software engineering field. The exhibition will cover all aspects of the conference. Details from conference secretary, Computational Mechanics Centre, 125 High Street, Southampton SO1 0AA.

# SOFTWARE MONTH

## Financial and project planning

IN the welter of off-beat applications now coming on to the market, it is easy to overlook the basics. Yet financial software - accounting, general ledgers and the like - still accounts for a huge part of software revenue and spending, in a market which is becoming fiercely competitive.

Software Month examines how far the industry has got in creating good, reliable financial software, and also looks at the other possibilities that open up - financial modelling, project planning and so on - once that valuable basic data is on record.

Financial and accounting needs are often behind a company's initial decision to buy a computer. In the early days of computing, the first applications were nearly always accounting and financial ones, taking over from long-established methods of bookkeeping by hand. Other uses for the computer came later.

Often it was a matter of commissioning a software house to write a tailor-made piece of software, a lengthy and expensive business.

The basics of accounting - what goes in and out, credit, debit, monies owing and overdue, outstanding bills and debts - are universal, although each company's method of operation can be vastly different.

It was this factor that led financial software to become the first target for software "packaging". Software vendors, at a time when software was emerging as big business, realised that they could cater for much larger markets with less effort and investment by producing a general-purpose "package", which would cater for the everyday needs of a firm, although usually with some tailoring.

Many accountants were absorbed into the computing business this way. Companies like CAP, now huge and diverse in its software interests, were founded by accountants who

realised early the huge market for high-quality reliable financial applications.

But that didn't mean that financial applications were perfected. Far from it. A blend of programming and accounting skills was needed, but that wasn't enough.

Problems came when outside factors changed. Even a company with a smooth-running system could find that changes in the law, tax regulations, accountancy practices and so on could lead to lengthy and expensive maintenance and updating of their systems - witness the flood of packages offering current-cost accounting recently when the SSAP 16 accountancy rule came into force.

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Cowboys selling microcomputer	23
Upgrading your system	23

This is still the main problem facing financial software manufacturers. It has to be supported as well as being reliable in the first place, since once a company has abandoned its book-keeping by hand in favour of machine-held data, it is at the mercy of the computer and its software.

The same pattern is holding true in the microcomputer world, which has expanded the marketplace for software, and in particular financial software. Companies like PPL, MSA and its recently purchased micro arm, Peachtree, already flourish on the strength of

financial applications, and many smaller companies, such as Compact Accounting, are following suit.

Support and maintenance are still key issues, which is why bureau services like RTZ Computer Services, RHM, and many others, keep in the running. Often those who urge that their product is more expensive because it is well supported will win over the cheap solutions, simply because a firm's data on its transactions is its lifeblood, and not many people are willing to invest in a computer without taking a long hard look at the quality of software to go with it.

With the microcomputer's emergence as an increasingly competent business tool, a race has begun to put certain well-established and proven applications on different machines. The pattern already set in the earlier eight-bit market of "approved suppliers" is being enthusiastically followed by the vendors of 16-bit "personal" computers.

As ICL, IBM, NEC and others all opt for the same software vendors, the various microcomputers are looking more alike - except perhaps for the price. "User friendliness" is a feature they have in common, allowing end-users to get their hands on their own data.

Once that has happened, the possibilities do not stop with the selling of everyday financial applications. Once the data is there it can be put to other uses - modelling and planning being the two which are already tipped to become the big software-revenue spinners of the Eighties.

So Software Month goes beyond the basics, with a look at the financial modelling and planning software which, even if it initially appears expensive, may save companies thousands of pounds in the long run.



Companies like CAP were founded by accountants who realised early the huge market for financial applications.

## How to transform crystal ball predictions into factual reality

Planning packages can range from £200 to £20,000. . . Jim Horsley reports

The process of deciding where to go to get what you want comes down to identifying precisely what kind of system meets your company needs now and in the foreseeable future. Most companies already have comprehensive historical accounting systems which may be manual or computer-based, and it is often a question of being able to use that information as the basis for forward planning.

For this reason several suppliers now sell integrated financial systems so that information can be automatically transferred from sales or general ledger files, for example straight into the financial planning system. Other suppliers have concentrated on the stand-alone approach so that managers within a large organisation or indeed the managing director of a small company can have a personal approach to building models and planning plans.

Alan Peat, sales manager of management systems at SLA Computer Services comments: "Ninety per cent of our financial planning clients have their own computers to carry out the basic accounting and ledger work. The users are mainly decision-makers who want

to be able to do their own thing and therefore need their own financial planning facilities."

But what exactly are companies looking to achieve from their planning systems? According to Sutcliffe of EPS, the current economic climate is making short-term control a higher priority than long-term planning. Such areas as project and acquisition appraisal and management reporting are the key issues affecting many companies.

At a time when cash is in short supply in most industries, there is also a growing need to ensure that projects undertaken either on behalf of clients or internally are completed on schedule and within defined budgets.

Project planning is becoming another key area for computer systems and a number of companies are now supplying project systems.

Thorncroft Manor Services, for example, has converted a time-based PERT project system to run on a range of microcomputers and as managing director Bob Cooper comments: "Up until recently only large machines could handle the number of activities required for large projects. With a 64K micro

we can handle up to 750 activities, which is a pretty large project."

The size of machine selected to run the planning system is becoming an increasingly important issue. Originally planning systems were either based on mainframes or on time sharing bureaux, as they had the capacity to handle large and complex models.

Today that is not the case. It is interesting to note that companies such as EPS, which have in the past concentrated on mainframe-based systems, are now developing micro-based products for a new and rapidly growing market area. Products such as Visicalc and Supercalc have made a major impact in the UK since their release.

Intelligence UK has sold 2,000 Micromodeler systems in a year and according to the company's sales director John Butler, at a total cost of £3,500 for a working system, people are prepared to have a go. It is this move to micro-based systems which has brought planning into the financial reaches of most companies and has opened the door to a large number of suppliers.

If Supercalc on Apples and Peis has stimulated the planning market, then other companies have

financial systems. As with most planning packages, Finplan is described as easy to use and has a two-tier approach to building models and forecasting. At the first level users build a model through a series of questions and answers - which Tomkins admits is a fairly slow process.

Once the user gains more experience, however, he or she can edit the modelling language directly which cuts a lot of corners and speeds up the process dramatically. Tomkins believes that in the future we are likely to see a new generation of micro-based planning packages which have modelling languages more directly related to user requirements and which have more powerful facilities.

It is this ability to provide systems which relate directly to end-user requirements that Intelligence UK has tried to address, firstly with Micromodeler, which runs on most CP/M-based micros and secondly with Decision Modeller, which the company describes as a strategic planning model.

Sales director John Butler believes one of the key aspects to Micromodeler's success is that it is not menu driven. Users have an English-type language which they use to tailor models to their precise needs. As the system works purely on a numbers basis, it can be used in areas such as marketing, stock control and production, as well as for financial planning.

The system has two other advantages over many standalone micro-based planning systems. Firstly, an interface is available which means it is possible to link Micromodeler into other compu-

Turn to page 19

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0915 Keynote: some basic definitions of the sources and kinds of finance  
Sir Frederick Wood

0945 The role of the clearing bank

John Sanders, Manager, Barclays Bank plc, Oxford Street Branch

1015 Questions

10.30 Coffee

1100 Non banking finance: venture capital

Geoff Taylor, General Manager FFI Group

John Robertshaw, Director, United Computers & Technology Trust  
how to get backing from the government

Dr John Parkes, Senior Principal Scientific Officer, Dept of Industry

1200 Questions and panel

Speakers from morning

1230 Lunch

1400 Business Plan: what to prepare and how to present it

Ian Lovett, Manager, Corporate Business Department,

Barclays Bank plc

Kevin Cahill, Associate Editor, Computer Weekly

1430 Raising the money: experiences of two computer companies

Eddie Bleasdale, Managing Director, Bleasdale Computer Systems Ltd

Naomi Langford Wood, Joint Managing Director, PME Ltd

1530 Tea

1600 Cash Flow: how to survive and grow up

Ron Weedon, Managing Director, Keen Computers Ltd

1625 Questions and discussion: bridging the gap between computer companies and financiers

Led by Frank Sumner, Professor of Computing Science,  
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1715 Close

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## SOFTWARE MONTH

### From crystal ball to factual reality

● From page 17

ter systems for extracting information. Secondly a Micro Graph-power package is currently being released, which means that graphs produced within the planning system can be printed off on a five-colour plotter.

If Micromodeller makes no assumptions about the kind of application the user requires, then Decision Modeller certainly does. The system is designed to assess the impact of defined changes across the whole structure of the company.

Currently about 100 such systems have been sold, but Butler believes that they may have to make the structure of the system more flexible before it is more widely used.

Intelligence UK is planning to convert its micro-based systems to run on larger processors including DEC and Hewlett Packard systems, so that Micro Modeller can be used on a distributed basis. This is in marked contrast to companies such as EPS which are going from mainframe and mini-based systems down to micros.

It is impossible for any mini-based system to compete in a price war with the micro. At about £15,000 for a basic system, the mini has to draw on its strengths of a larger processing capacity and the ability to handle large volumes of data.

As Mervyn Robertson, systems director of John Bradburn (Computer Systems) comments: "There is a lot of interest in our minicomputer based planning system. The biggest question is cost. They are

comparing our system with something like Visicalc or Micromodeller."

He adds: "We recently carried out a pilot study on behalf of a retail shop chain with 62 shops to create an operations plan for 1982. That was a large exercise in terms of data handling, which most micros would not have been able to handle."

Computing services companies have been hit by the dramatic growth in the micro market. SIA Computer Services' Feast says his company has not suffered because it has concentrated on providing services which cannot be handled by a microcomputer.

In terms of financial planning, SIA has the advantage over the mini or mainframe approach by being able to provide a selection of 20 or 30 different forecasting systems through a terminal on the user's desk and also by providing access to database systems covering a range of subjects.

Whatever the arguments, computer-based planning systems are rapidly becoming a fact of economic life for many companies. From the bottom of the range Visicalc package, through to the mainframe or bureau-based system, most organisations are realising that it is important to spend in the short-term to ensure long-term survival and stability.

As long as the suppliers provide the combination of hardware and software and the support and advice needed to guide companies through the learning process, then computer-based planning is a growth market which will gain in credibility.

### Users get hooked on computerised planning

COMPUTER-based systems have an almost addictive quality which leads rapidly to them becoming central part of the planning process. This was the major conclusion of small and large companies which have replaced manual planning techniques with micro and mini-based systems.

Financial director of Rexco Brian Taylor has used both a time sharing and a micro-based planning system during the last four years and has become increasingly committed to using modelling as a means of calculating sales and production targets.

"The use of such systems forces the directors to take a forward look at the position of the company and to evaluate the alternatives available. At one stage we were able to predict nine months in advance that it was essential to close down one of our plants otherwise we would have been insolvent," said Taylor.

"Because we were able to plan ahead, the closure went ahead much more smoothly. Planning on a manual basis is a long operation and you can get so involved in the process you lose sight of your objectives," he added.

Rexco, which currently has about 200 staff, is using the Fin-plan system based on the ACT 800 series. Taylor emphasises that to make the most of any financial planning system it is essential that users become competent in running their programs.

The level of interest in financial planning has grown to such a degree, however, that many people within the company are now developing their own models. As well as cash forecasting, the system is used for the production of quarterly statistics, sales and management reporting and as a database system for information on projects.

"You need to know how the model works and where to home in to make any changes. The only danger in financial planning is that you can make far too many runs to produce alternatives for one plan. What it does is draw together people from all sections of the company," he said.

ICI has also experienced a similar response in the use of computer-based planning systems. Several divisions within ICI have installed the EPS FCS system which can be used on a wide range of mainframe and minicomputers.

Peter Whyte, an accountant in the controller's development group of ICI, said there had been an "explosion" in the use of financial planning after the installation of the in-house EPS system.

Since the system was first introduced in 1978, the amount of storage capacity has been upgraded from 80 Mbytes to 300 Mbytes, and the number has grown from three to 13.

"It has enabled us to get rid of a lot of the legwork in producing data. We have also been able to generate more flexible reporting and in terms of cash forecasting it allows us to run a lot more scenarios," said Whyte.

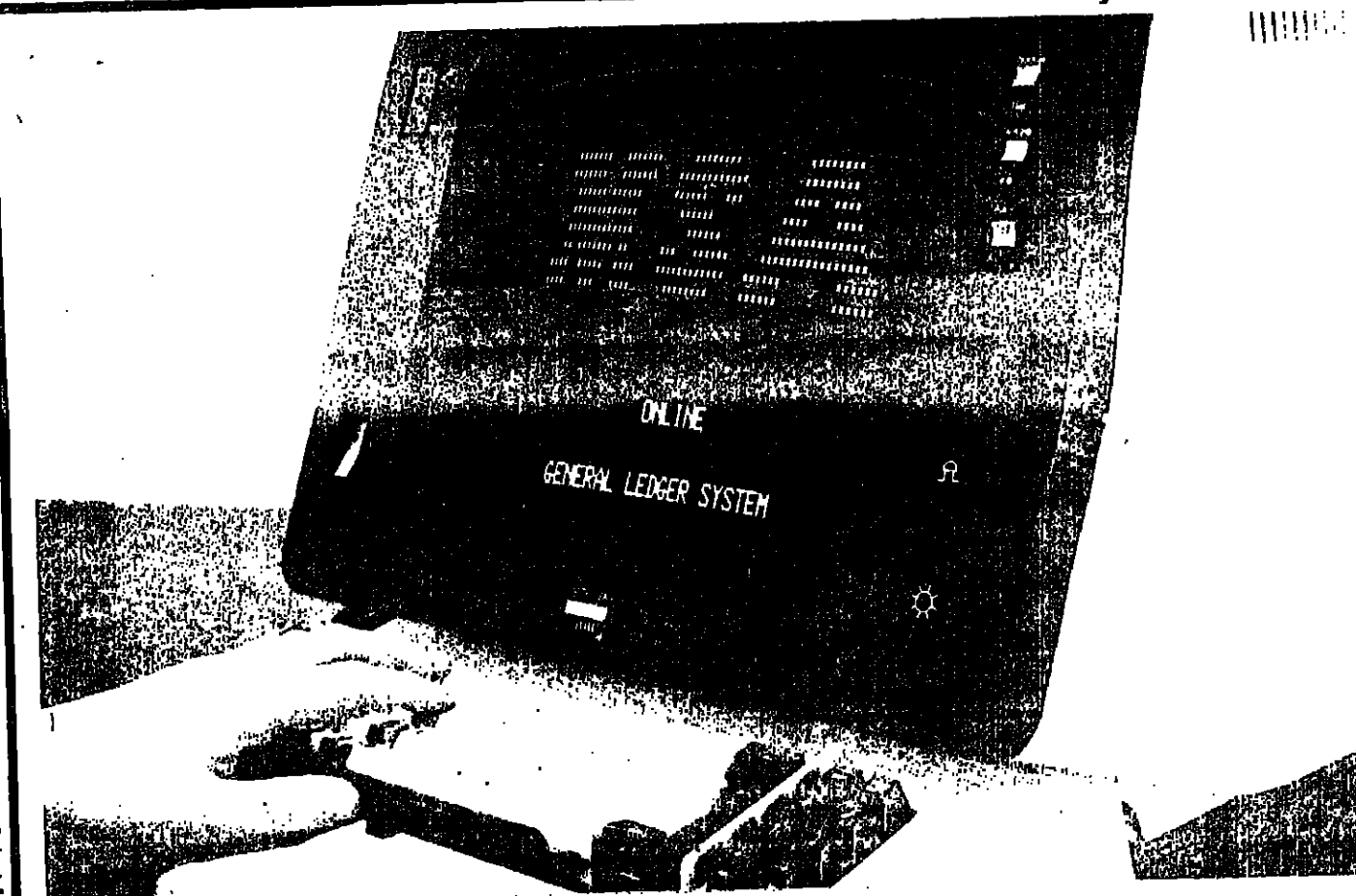
Whyte's department has used the FCS system as a high-level programming language to develop a range of models which people within ICI can use in a number of different ways.

The level of interest in financial planning has grown to such a degree, however, that many people within the company are now developing their own models.

As well as cash forecasting, the system is used for the production of quarterly statistics, sales and management reporting and as a database system for information on projects.



It is impossible for mini-based systems to compete in a price war with micros.



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## SOFTWARE MONTH

### AI leads in the next computer age? Don't hold your breath!



Ferris is a consultant in the UK and US providing marketing and planning advice to computer vendors, particularly in the area of software.

severe disappointment. Investors are being encouraged to dabble, and many will be intrigued to find that nothing sellable results from their expenditures.

Important and valuable work is going on in the AI labs, but commercial products are unlikely to proliferate until the end of the decade.

David Ferris

"FOR the first time, so-called expert systems can take the place of human experts in any field." Exaggerated and incorrect statements such as these, from a recent issue of Business Week, are turning artificial intelligence into a hot topic.

In fact, Business Week, normally august and conservative, used its front cover to announce ARTIFICIAL INTELLIGENCE - THE SECOND COMPUTER AGE BEGINS. And Datamation, highly regarded in DP circles, runs such provocative headlines as AI Comes of Age and AI - Key to the (Japanese) Fifth Generation.

All this makes for exciting stories, but to my mind, everyone's getting carried away. AI does have very valuable things to offer, but as far as commercial products are concerned, almost nothing is available now, and precious little indeed is in the works.

This week I shall try to show that the public's appetite is being prematurely whetted - the fruits of AI are unlikely to be ripe for several years yet.

The first thing you should know about AI is that whenever an AI expert gives you a neat definition of what his field is, take what he says with an immense grain of salt. So far, the experts have not quite been able to agree about what they do.

The facts are that AI researchers are clever people trying to do a number of clever, difficult, and interesting things with computers. Quite often, though not always, they try to make computers do things human beings can; quite often, though not always, they fail in their endeavours.

Equally, however, AI researchers have had their share of spectacular successes, any of which would astonish your average Cobol programmer.

Today's AI community is fairly small, largely restricted to a handful of universities such as Stanford, MIT, Carnegie Mellon and Edinburgh, and the research labs of a few major corporations such as Xerox, Fairchild and Hewlett-Packard.

Some major areas of AI interest are as follows:

Expert systems. Programs which can be taught about a very narrow area of expertise such as oil prospecting or disease diagnosis, and which can provide expert advice on the issues concerned.

Natural language understanding. Developing programs which understand ordinary typed English, rather than just "English-like" languages.

Mathematical theorem provers. Programs which can reason mathematically, and judge whether a proof is correct. Some of these are now so sophisticated that they can teach graduate level mathematics. Continuous speech recognisers. Understanding ordinary conversational speech, unpunctuated by artificial silences. A very nasty AI problem.

Vision analysis. Ways in which computers can analyse TV camera signals to determine what is represented. Also rather nasty. Automatic program generation. Programs that can read a non-technical description of what a program should accomplish, and then actually write the program. Intelligent robotics. Developing control software for devices varying from hand-eye systems to robot vehicles. Sometimes they are capable of planning and executing complex tasks.

Right now, AI is gradually moving from the research labs to the corporate world. Notably, a number of large companies are building extremely specialised expert systems, for in-house use only.

Much of the recent excitement has centred on these developments. Unfortunately, the commentators often overlook that such projects are highly turnkey in nature, serving the specialised needs of a particular organisation, and are unlikely to result in products suitable for general sale to end users, DP managers, OEMs or the like.

So what real AI products are out there? When you count them up, very few indeed. Probably only two clear-cut candidates, in fact.

Artificial Intelligence Corp, of Waltham, Massachusetts, has a very nice natural language query system called Intellect. Using this, you can sit down at a CRT and type in questions in ordinary English (as opposed to a structured English-like language) about your corporate database, which Intellect then answers. Currently there are about 60 installations, so Intellect is certainly a commercial success.

The other unambiguous AI products come from Machine Intelli-

gence Corp, of Sunnyvale, California. MIC is a new company selling vision systems - computers which can analyse TV camera input, and work out what is being scanned. The systems are primarily intended for use in a manufacturing environment, often for the intelligent control of robotic arms.

#### SOFTSELL

Beyond these two firms, it is hard to find uncontentious AI product vendors. Radio Shack sells Eliza, a program which unconvin- gingly pretends to psychoanalyse the user; few researchers would agree that this has much AI-ish about it.

Then there is The Last One, from DJ "AI" systems; a program generator for microcomputers which has absolutely nothing to do

with AI other than in its marketers' minds. (In fact, there are a number of such AI false pretenders.)

So for the moment, there is not much available by way of AI products. Does the immediate future look any better?

Again, don't hold your breath. There is a lot of talk and very little action.

Teknowledge has ideas for program development products, but no concrete plans. A company called Cognitive Systems, based in New Haven, Connecticut, has optimistic plans for several natural language systems for business users, but development is still at a very early stage.

Down in Texas a new startup is planning to develop an Ada teaching machine which may use AI technology; and in Palo Alto, Inteligenetics is selling time sharing

access to very specialised non-AI software which might have AI technology incorporated in the future.

And then we come to the Japanese, who are making a lot of inscrutable noises. They are busily showing off impressive block diagrams for a future "fifth generation" AI machine. These have little boxes labelled with terms like "knowledge base", "problem solving machine", "access using natural language, speech, picture, etc.", "inference system".

All very AI-ish and impressive, until you realise that the Japanese don't know much about AI and that these diagrams have more to do with very speculative hopes than any tangible development plans.

What concerns me most about all the recent publicity is that the world is yet again being set up for a



Intelligent robotics: Commander Bill of Warwick University negotiates a flight of steps.

#### ROUND UP

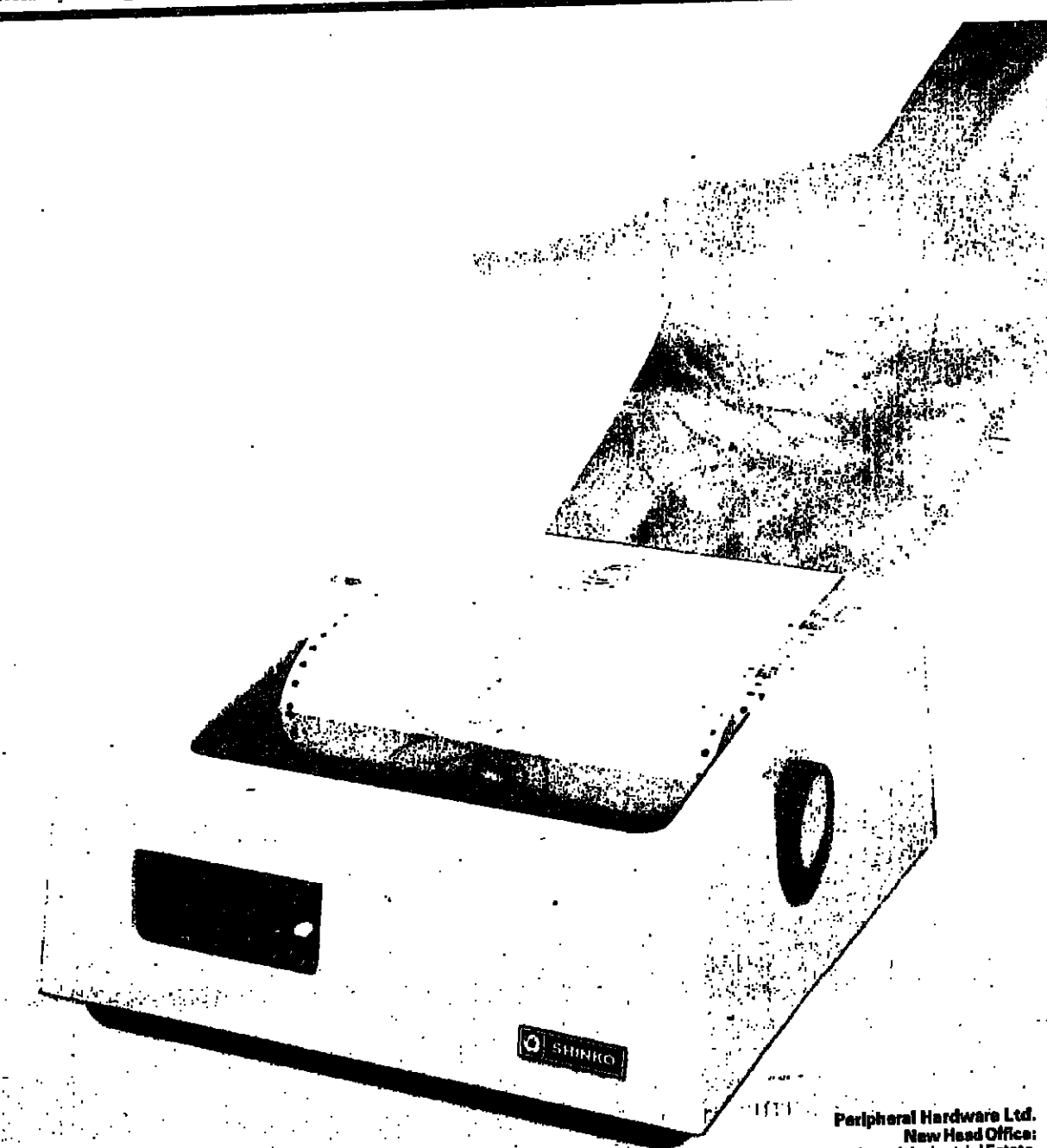
FOLLOWING ICL's lead, Hewlett-Packard and Digital Equipment both announced schemes to assist third-party software suppliers.

Hewlett-Packard is launching a marketing programme called HIP Plus, which offers incentives such as discounts on equipment on top of marketing assistance, while DEC plans to set up a directory of Digital Classified Software.

A microcomputer package claimed to offer the facilities of a standard CAD system for under £10,000 was launched by KGB Micros of Slough. Developed by project management specialists

Hytech Consultants, Micro-Designer accepts input from the keyboard, plotter feedback or via a digitiser pad and offers symbol rotation, repetition and shading as standard.

Microcomputer database system MDDBS is to become widely available in the UK following a link-up between US software vendor International Software Enterprises and UK consultancy Pictel. The joint venture, ISE-Pictel, is aiming to tempt large users in multinational corporations with the latest implementation, MDDBS III, for between £2,500 and £5,000.



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**PHL**



# SOFTWARE MONTH

IS IT too late for decent ledgers in the computer industry? This is a question that many first-time users and suppliers are asking as an increasing amount of software fails to keep the promises made in the glossy brochures.

Because of the slowness in developing financial applications in-house, many users have bought personal computers out of their departmental budgets — sometimes with disastrous results.

But mainframe-oriented suppliers are fighting back, spurred on by the falling price of hardware and selling applications into the 16 and 32-bit minicomputer market.

This has two advantages for users. One, they cash in on a wealth of existing software expertise and, two, they get faster and more efficient systems which can also talk to their organisations' main databases.

"MSA addresses two main markets — the established mainframe user and new users," says MSA's managing director Michael Hunt.

"Traditional batch computers have got to breaking point — do they develop applications in-house or buy in? As hardware costs are coming down, we are jumping into the 4321 market earlier and they want packages."

"Today everyone wants online

## Mainframe suppliers fight for accounting packages market

Disappointed users are wondering if good ledgers exist, says Chris Youett

and database applications. All our development work is oriented to making software more user-friendly."

He adds: "I expect to see a lot more online products and the company sees an integration of micros and mainframes. We must have software that is compatible to the central database. Modelling tools that can be used on a micro will make packages a lot more user-friendly."

ICL distributor Systemsolve has recently signed the Trader Point agreement to market the ME29 super mini. Director Peter We-mys sees the kit as "irrelevant up to a point. Selecting ledger systems depends on where the user wants to enter the DP market."

"It is important to pick the type

of ledger to suit the user's requirements and then pick the hardware to run it on. It is important they don't go to the manufacturer."

"Ideally, you should go to an independent supplier and try for a user-driven system," he adds. Some accounting practices have gone into the ledger market, largely because they could not find software good enough for their clients' applications.

At mainframe level, there is Knight Consultancy Services, based at Croydon. Its software is written in Ansi Cobol and will run on IBM systems using the 360 instruction set, Univac, Honeywell, Hewlett-Packard, Wang, Burroughs, DEC VAX, Data General and ICL kit.

Knight, which is part of the

Price Waterhouse Group, was set up by Geoff Knight after a Honeywell user asked him to find a suitable ledger system.

"We couldn't find one," says Knight, "so we wrote our own. There was a need for software that matched UK and Continental accounting practices and could handle multi-currency and multi-lingual transactions. It is a British pack written by British accountants."

"There is a growing market for standalone machines which can talk to mainframes. It is not as simple as people make out. Operating systems, for example, are still not sophisticated enough for a good ledger system," he adds.

There is also growing concern

among data processing managers about what they consider the encroachment of micros within their organisations and the subsequent duplication of effort and facilities.





A user may soon tell a robot to carry out a task without having to describe how to do it. . . Phil Manchester reports

## Programming the robot to solve its own assembly problems

EARLIER this year, the Science and Engineering Research Council announced its sponsorship for a working party to examine the requirements for a programming language for assembly robots.

The SERC initiative is, perhaps, a reflection of what is a minor revolution in the robotics research community - the transition from what might be called sophisticated machine tools to highly flexible general purpose robots for assembly tasks.

The group has in fact existed for a couple of years informally and includes robotics researchers from four universities and a number of commercial companies.

Underpinning this development is a body of knowledge about programming assembly robots from a number of sources.

Mike Tidd of the University of Aberystwyth, a consultant to the software house SPL, explains it as

"a growing interest in programming robots offline".

As Tidd sees it, most commercially implemented robots are currently programmed by example in what is called in robotics jargon "teach mode". The best known example of this is the paint spraying robot without which no TV program on robots is complete.

The operator performs the task which is recorded on some form of tape. The robot will repeat the task every time the tape is loaded and will go on doing so until the equipment either wears out or a new program is recorded. This recording process is viewed as a slow and laborious method of setting up a robot and leaves no room for flexibility in the process.

The move, therefore, is now towards offline programming. As Tidd explains: "In a perfect world with complex short runs the way forward is thought to be offline programming - ideally expressed in some form of language."

The key phrase is "complex short runs". Ultimately, the current research is aimed at producing a means of programming robots in such a way that they are able to solve problems in assembly themselves.

Unimation's Puma robots, for example, offer a programming language (VAL) which goes some way in this direction but it relies upon the engineer charged with the programming having a clear idea of what is required as well having to describe how the task is to be performed.

"He knows all of the situations that may occur," said Tidd. "But we need much higher level languages where the engineer describes the problem and lets the robot sort out how it solves it."

"It is very hard," he went on, "particularly when you throw in the idea of flexibility and realise that you are dealing with a world full of uncertainties."

This takes the subject into the realms of artificial intelligence as the robot is required to perform some elementary reasoning about the problem and how "it is to solve" it.

It is no surprise, therefore, that one of the major developments in this area emanates from the University of Edinburgh's Artificial Intelligence Laboratory. A group led by Robin Popplestone has been working with SERC sponsorship for a few years now.

The language they have come up with is called RAPT (Robot Automatic Programming Tool) and is referred to by one of Popplestone's team as a "model based language".

"Pat Ambler of the AI lab explained: "It is really a development of APT - a language for numerical control machinery."

"It has a syntax like APT which enables us to take advantage of the familiarity that engineers have with it. But there is an awful lot of mathematical reasoning behind it because assembly processes are about picking objects up and putting them on top of others."

What you need to be able to say is pick up part A and attach it to part B," he went on.

The RAPT language is currently running on the AI lab's DEC System 10 using the AI language POP 2 for its implementation. The Edinburgh group is, however, much more ambitious about future work in this area. Ambler looked into the future and suggested that the real breakthrough would come when such systems could take sense data into consideration.

"Using a camera system we can give the robot some vision as well as being able to derive data about touch and applied forces. We are currently working on the sort of assumptions that can be made at the planning time. It depends

upon the sort of support that is forthcoming from industry and SERC but there could be some breakthroughs within three years," said Ambler.

Tidd described Edinburgh's RAPT language as the world leader in this area. But there are other efforts taking place in the US - particularly in IBM.

Although not released in Europe as yet, IBM has a robot assembly language of its own. More details of this language and what it can do is expected to be forthcoming fairly soon and both Ambler and Tidd were excited about the upcoming meeting of the SERC working party to be held at IBM's UK research facility at Hurley.

As part of the SERC working party, IBM has an interest in both its own work and Edinburgh's.

Its language, AML (Manipulator Language) is described in a recent paper presented by David Grossman of IBM's Yorktown Heights laboratory at the Robot VI conference in Detroit at the beginning of March. "AML is both a good robot language and an excellent computer language, combining some of the best features from Algol, APL and LISP in a blend particularly suited to robot programming."

AML was developed from earlier work by IBM which began a decade ago. According to Grossman, IBM's work on model-based systems, as opposed to teach mode systems, began in 1975.

Grossman also refers to another project in developing model-based robotics programming - EMULA which allows AML programs to be simulated offline with optical graphics display and some of the effects of sensory feedback.

IBM is extremely keen to harness the power of robots for its own internal use. Grossman outlines a number of current applications, including one for small batch assembly. It is, however,

**It is a pity there are no initiatives in the UK to solve some of the more mundane problems.**

fairly cagey about tying its research work to any future product announcements.

AML, however, is in the real world (in the US at any rate) already and is likely to form a major contribution to the future development of robot languages.

In addition to IBM there are number of other commercial concerns involved in advancing SERC through the working party, including Philips, GEC Marconi, Rolls Royce, Hall Automation and British Robotics Systems. The latter has links with SPL, which appears to be making a significant mark in the whole area of artificial intelligence. The University involvement comes from Hull, Cranfield and Cardiff as well as Edinburgh.

It is to be hoped that SERC's initiative goes beyond pure research and into the area of product development or the UK will be left behind in the race to turn good ideas into commercial reality. As Mike Tidd commented on the advanced nature of the Edinburgh work: "RAPT is a leading contribution but it is a pity there are no initiatives in the UK to solve some of the more mundane problems. That, presumably, is why IBM's work is mainly about

The mainframe upgrade path can be seen as a delight for the corporate empire-builder, says Ivan Newman

## 'Keep it costly by keeping it complex' is IBM strategy

"What IBM now has to do is to sort out the tangle of operating systems to reduce machine overheads and cut . . . cost (to the IBM user)."

SO concluded a recent leading article in this paper. Odds on, however, that this hope for a reduction in cost is far from the corporate mind.

To find the evidence for this conclusion one had only to refer to a DP salary survey in the same issue.

Broadly the conclusion of the survey was that increasing DP staff shortages is likely to force up wages. Both the leader's subject - IBM mainframe upgrade policy, and the survey results - higher DP department manpower costs - are two different sides to the same corporate mentality. This corporate mentality comprises not only corporate strategy but also the corporate manager's/executive's motives.

What drives the corporate executive? (Executive can be taken to mean any person within the organisation who has powers of execution of targets, budgets and/or manpower). Briefly stated, the executive's driving force is the satisfactory achievement of output figures, working to budget and maintenance of manpower levels.

The plug-compatibles' higher market share is a result of their fitting into IBM strategy

**The plug-compatibles' higher market share is a result of their fitting into IBM strategy**

In the words of Battalia and Tarrant's The Corporate Eunuch, "The harried executive (knows) that he is to be judged by results." However, the authors caution in that same book, "Perhaps the most distinctive boon - and ultimate bane - conferred upon the manager is the privilege of isolation from reality."

One result of this is that "(the executive) finds himself increasingly forced into a position where he juggles figures . . . to produce these results". Perhaps the "juggling" is achieved and therefore the judgment on results during the annual round of re-negotiating targets, forecasts, or budgets which often lays low the corporate management for some weeks.

Perhaps it is even on the size of increase or decrease that the executive's reputation is likely to be built. The targets themselves have displaced their proper achievement in the judgment of relative success or failure. But what has this to do with mainframe policy? Just this:

Top DP staff also fall into this definition of corporate executive and in that sense are probably also driven on among their peers by just such factors as DP or management services department size, ratio of chief senior analysts to senior systems analysts, increase in overall budget, increase in capital budget, etc.

What, then, about the hope expressed in the leader of cutting costs to the IBM user (and eventually by knock-on effect other users)? If the choice is to offer "more bang for less buck" i.e. reduce costs absolutely, then the executive faced with spending a given amount could well decide

not to accept the offer for fear of not spending a budgeted or allocated amount, because too much understanding in any one year might lead to a reduction in budget next time.

However, if the choice is more bang and more buck the corporate acceptability might be much greater.

These last points could be the clue to IBM's strategy throughout its product range which, viewed cynically, could be described as exploiting the traits of corporate one-upmanship or alternatively be looked at as expert marketing acumen.

In short, the strategy appears to be one of keep it costly by keeping it complex and relatively incompatible. By so doing, the IBM upgrade path is strewn with the need for more capital budget, more manpower, and more administration to the probable, if veiled delight of the responsible corporate decision maker who sees his empire growing through "genuine progress".

Hence the multitude of operating systems, terminal types, conversion requirements.

As far as the plug-compatibles are concerned, this approach weakens because it divides. Just so long as there is such a plethora of complexities, machines and architectures the plug-compatibles will be forced to divide their efforts in order to offer a broad enough range to compete.

However, too broad will result in under-investment and under-development in the product, while too narrow an offering is a gamble of large proportions. No doubt the IBM corporate watch-phrase is "keep 'em guessing".

The plug-compatibles' increase in market share, at cost to the traditional mainframe makers, is a result of being able to fit into the broad IBM strategy of not having a compatible approach while still offering more machine for money.

In terms of the traditional mainframe competitors offering greater upgrade compatibility they have suffered reductions in market share. Why? Look again at the corporate man. The very last thing he wants to happen is for the manpower requirements to fall, or the capital budget to be under-spent, or the backlog of work to fall significantly.

Given an equipment range offering the same or more power as equivalent IBM, obviating the need for conversions and reducing the complexity all at a lower real cost than these features, desirable though they are, may be seen as the ruination of a nice corporate empire.

Who would buy the features? Certainly not, the person whose empire is threatened. That is the wrong person!

What lessons can be learnt from this? Perhaps one for IBM-watchers. Namely, do not look for necessarily logical hardware and/or software decisions in terms of the end user but rather permute the options in a marketing sense to:

- Assist the corporate empire builder.
- Lock out traditional competitors.
- Keep the plug-compatibles guessing.
- Increase user dependence.

If that appears cynical, take heart, for every other manufacturer is trying, or would like, to do the same; however, everybody sees IBM doing it.

This author is sales training manager for Burroughs.



"IBM's upgrade path is strewn with the need for more capital budget, manpower and administration."

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For information about exhibiting at Compec Scotland contact Chris Timmins, Executive Director, IPC Exhibitions on 01-643 8040 Ext 4869. Or clip the coupon.

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## Practical Computing

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## PRODUCTS - 1

## Round the world in 20 secs

REFLECTING the move to even smaller electronic circuitry, the Infotec 6100, a new microprocessor-controlled digital facsimile from Kalle Infotec, can send an A4 document across town or around the world in just over 20 seconds.

The machine is a Group 3 model (with Group 2 compatibility) and is designed to keep transmission costs down to a minimum while retaining high-quality reproduction.

Although the Infotec 6100 is compact the state of the art technology enables it to transmit sharper, clearer copies of typed, handwritten, drawn or photographic material over any distance using conventional telephone lines, say the makers.

A feature of the Infotec 6100 transceiver is its ability to transmit up to 64 shades of grey. This means that photographs (both black-and-white and colour) can be faxed with very little loss of subtlety in depth of shading.

Operating flexibility is one of the key features. Transmitting documents is simple; the operator



The Infotec 6100 facsimile from Kalle Infotec.

just telephones the destination, inserts the copy to be faxed, then presses a button. Return mail can be received on the same call, so there is no need to re-dial.

The Infotec 6100 costs £7,295. Kalle Infotec (CW), 155 Gower Street, London WC1. Telephone 01-388 7271.

Functions include automatic guilting, a reduction facility, and the automatic document feeder which allows up to 50 documents to be transmitted unattended.

The Infotec 6100 costs £7,295. Kalle Infotec (CW), 155 Gower Street, London WC1. Telephone 01-388 7271.

## Step forward in factory data collection

THE Series 3000 Factory Data Collection Facility (FDCF) introduced by Honeywell combines an extensive range of terminals and systems software designed to give manufacturing industry increased monitoring capability and resource control relevant to labour, materials, work in progress, finished goods inventory, and other areas of factory operations.

FDCF works as a standalone facility via the DPS 6 or Level 6 minicomputers; or it can run as part of a distributed processing system in association with Honeywell's medium and large computers or with other compatible host processors.

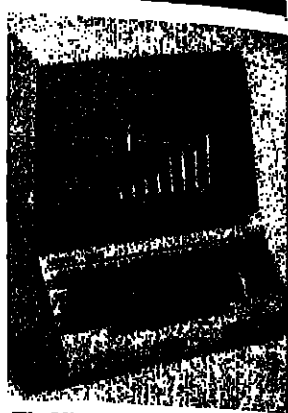
In its DSB (Distributed Systems Environment) role, FDCF equipment can be deployed at many different locations, and at selected work areas within those locations, each collecting data (eg on labour reporting, quality monitoring, stock-room control, work in

progress, time and attendance) which, formed into transaction files, can then be transmitted to the central computer system for processing.

According to Honeywell, the Series 3000 FDCF offers new levels of performance and cost benefits, including savings in inventory, more accurate product costing, improved information flow, reduced paperwork, increased productivity, better component control, lower downtime as a result of more efficient machine monitoring and maintenance, faster machines restart, and easier progress chasing.

A typical price for a distributed system comprising a mixed cluster of 20 terminals would be £75,000. A standalone system comprising a small cluster of six terminals is typically priced at £38,000.

Honeywell Information Systems (CW), Honeywell House, Great West Road, Brentford, Middx. Tel: 01-568 9191.



The Visual 550.

## Graphics terminals

THE Visual 500 and 550 range of graphics terminals providing Teletext 4010 compatibility, 768 x 585 resolution on a 14 inch screen for less than £1,600, is now being marketed by Techex.

The 500 and 550 models are compatible with standard business, laboratory and scientific software including Plot 10, Displa, Tell-a-Graft and SAS/Graph.

Techex (CW), 5b Roundway, Elliott Road, West Hove, Brighton, Tel: Northbourne (02) 16 71181.

## PRODUCTS - 2

## Data displayed in 16 colours on multiple screens

DIGITAL Equipment Company's family of colour graphics products has been further enhanced. The VT36 is an intelligent display control sub-system which enables data from a PDP-11 or VAX-11 to be displayed in up to 16 colours, as numbers or graphics, on multiple display screens.

It also performs dynamic picture update, automatically displaying changes in the user's database, as they occur.

Developed as a complete package, the VT36 combines an integral 16-bit microprocessor-based controller with sophisticated graphics software. All picture display tasks are performed internally, leaving the user free to concentrate on his application.

The dynamic picture update facilities make the VT36 particularly relevant to applications such as process monitoring and public utility network control, where the

speed with which operators and system controllers can react to new conditions is often crucial.

Up to four microprocessor-based VT36s can be connected via serial synchronous lines to a host PDP-11 or VAX-11. Each VT36 can in its turn support up to four display stations (video controller and monitor), but with a total maximum of 18 displays on one host PDP-11 or VAX-11 computer.

For a low-cost solution in applications where high system throughput is not required, up to four VT36 display stations can be configured locally on a PDP-11.

The VT36 is designed as a totally interactive system. It is always supplied with a joystick so that the user can simply and quickly interact with the system.

Digital Equipment Company (CW), PO Box 110, Reading RG2 0TR. Telephone: (0734) 868711.



The 1425 flat bed plotter from Benson.

## Plotting is controlled directly by operator

DESIGNED with the draughtsman in mind, Benson's model 1425 flat bed plots at up to 30 cm/sec and features an 80 x 24 character screen with qwerty keyboard housed with the electronics in a mobile, free-standing unit.

Many plotting functions can now be controlled directly by the operator via the keyboard and screen, including individual specifications of pen speed, acceleration and pressure to ensure optimum quality of inking regardless of pen type chosen.

The screen can be used to give full prompts of all operator controlled functions and messages from the user program. A reprint

function allows for exact overplotting on to a previously created drawing by digitising its size, position and orientation and precision alignment on pre-printed media is assisted by use of a magnifying lens fitted to the pen carriage, and portable hand-held joystick control for pen movement.

The 1425 can simultaneously accommodate four different pen types for plotting on single sheets of pre-printed or plain papers, including the media normally found in a drawing office.

Benson Electronics (CW), Techno House, Redcliffe Way, Bristol BS1 6NH.

## Addition to printer series

TWO new 132-column miniature printers have been added to Manneemann Tally's MT100 series, announced at Compec'81.

The MT130 is the simpler 100 cphs version; the MT140 offers 160 cphs and more options. Both are compact and low-cost. One-off retail price for the MT140 is £630.

The series is aimed at the microcomputer and the small

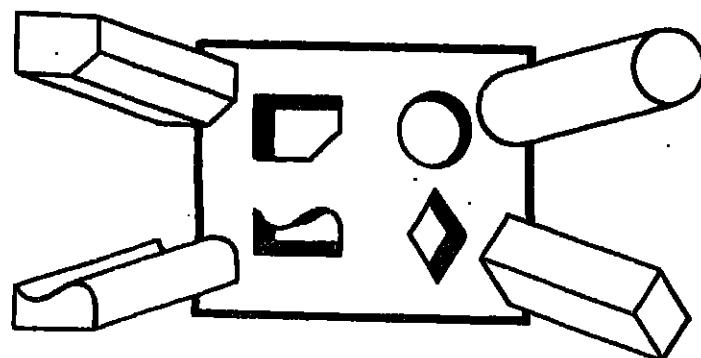
system. The printers are said to be quiet and easy to use.

Standard options include two-colour and OCR printing, eight character widths, programmable forms control and enhanceable paper feed.

Manneemann Tally (CW), 7 Cremyll Road, Reading RG1 8NQ. Telephone: Reading (0734) 580141 Telex: 847028.

Now available as a book  
£8 post and packing free

## DATA ANALYSIS



... a method of analysing the operation of a business to allow the best computer system design.

A major reason for the development of costly and inflexible computer systems is the failure to describe the business, its data and how it operates.

The Data Analysis methodology is a means of understanding what the business does independently of any consideration of the systems which may be used to computerise parts of it, and for analysing its data

independently of the applications to which it may be put.

First published as a major series in Computer Weekly, Data Analysis was written by Rosemary Rock-Evans and based on a methodology developed by Ian Palmer. Now reprinted in book form and fully illustrated, it is available from Computer Weekly.

Simply complete the coupon below.

Please send me ..... copies of Data Analysis at £8 each including p&P.

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The BDP double sheet feeder.

## Automatic feeding

A RANGE of automatic sheet feeders available from BDP (Word Processing), is designed to automate the feeding of paper and envelopes to the printer.

Designed as add-on units which can be attached to all popular word processors, including IBM and Rank Xerox, BDP sheet feeders require no screws, bolts or special tools. They feature an advanced separation technique which enables paper weights from 60 to 100 gsm and five-part multi-part sets to be used interchangeably without

any necessity for adjustment.

Depending on the model, BDP sheet feeders handle standard letterheads or form sets from 6 to 12 inches wide and up to 14 inches long. Double sheet feeders are available to hold letterhead and continuation sheets or any two different types of paper. An optional envelope feeder will accommodate envelopes up to 12 x 9 inches.

BDP (Word Processing) (CW), Hill House, Clock Tower Road, Isleworth, Middlesex. Tel: 01-560 7905.

## Genie of the micro

THIS month sees the launch of the Hong Kong-built Genie III microcomputer, which is marketed in the UK by Lowe Electronics of Matlock, Derbyshire.

Genie III is a fully expanded and integrated microcomputer, containing 64K of RAM, built-in screen, dual disc drive with double-density storage facility.

The basic Genie III computer will retail for about £1,600 and the professional purchaser can expect to pay up to £3,500 for a complete system including all peripherals and accessories.

Lowe Electronics has sold more than 10,000 Genie I and II home computers since it moved into the market three years ago.

## Tape prep system

COUNTING House Computer Systems has launched a low-cost standalone numerical control tape preparation system, GNC-1. It incorporates a powerful Computer Automation desk minicomputer and now also offers the power of high speed Winchester disc technology combined with the GNC-1.

With GNC-1, a picture of the component, the machine and the tool is displayed on a graphic screen. As soon as an operation is commenced, the tool movement is instantly shown on the screen.

This enables the programmer to check each stage of the program for errors and collisions.

Counting House Computer Systems, Foxhams St, Marlow, Bucks. Tel: 0494 68921.

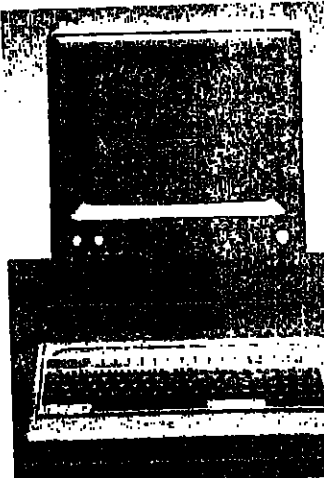
## Graphics at high resolution

WITH its fourth major new product release this year, Westward introduces the 2015 graphics terminal.

Based on Westward's 2000 terminal, the 2015 offers high quality graphics, with a resolution of 1024 x 768 pixels. The user can select the most comfortable operating position and has control over viewing angle, distance and screen tilt. The detached keyboard provides a selection of colour-coded keys and comes with a unique document holder, aiding data entry.

Key features of the terminal include programmable line styles, a "write-through" mode, choice of four character sizes and up to 8448 characters simultaneously displayable.

User options include plain paper or electrostatic copiers; graphics tables for rapid input of diagrammatic data, menu picking and cur-



The new 2015 from Westward.

sor control; and a four-page VDU buffer giving high speed scrolling and access to command information.

Westward Micro Systems (CW), Alexandra Way, Ashchurch Industrial Estate, Tewkesbury, Gloucestershire GL20 8NP. Telephone 298600 (STD 0684) Telex 437239.

## Total control for smaller networks

A POWERFUL new system that brings total data communications network control, management and trouble shooting within reach of users of smaller networks is announced by Racal-Milgo.

The CMS Series 2 is a compact complement to the large network CMS launched two years ago by Racal-Milgo. Exploiting the advanced technology of its larger counterparts, it brings the benefits of management control within the reach of networks funded by modest budgets, says Racal-Milgo.

Based on a powerful micro-computer and using advanced software, CMS Series 2 can monitor an entire data communications network from any point around the world. All management functions are performed on a dedicated second channel independent of the main data flow.

Using CMS Series 2, the operator can detect network faults in seconds. The system instantly alerts him that something has failed, then allows him through the colour graphics display to zoom in on the fault, identify it, and reconfigure the network to restore data flow.

Racal-Milgo (CW), Richmond Court, 309 Fleet Road, Fleet, Hants.

## Printer noise reduced

DESIGNED to reduce word processing printer noise by up to 85%, a new noise-absorbing cabinet from Power Equipment can be used with many of the popular daisy wheel RO (receive only) printers with twin sheet feeders.

Applications for the new Powerup Silencer cabinet, Model DEV 699, include the Rank Xerox 840, 850 and 860 printers, Diablo 630 and Quine 7-10 range.

Printer noise is reduced, on average, by 12-15 decibels which means the machines are 75% quieter in normal office environments, say the makers.

The Power Equipment Company (CW), Kingsbury Works, Kingsbury Road, London NW9 8UJ. Tel: 01-205 0039.

## COMPEC NORTH '82

Belle Vue, Manchester  
June 22-24, 1982

Tuesday: 10.00-18.00  
Wednesday: 10.00-18.00  
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## The most comprehensive computer exhibition in the north is on again soon in Manchester.

For computer users, suppliers, systems and software houses, consultants - anyone who is professionally involved with computers - this is the ideal opportunity to see and compare the whole range of equipment and services.

A day at Compec North is the most effective way of bringing yourself up to date in today's computer market.

**MAKE A NOTE TO VISIT**  
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COMPEC NORTH is a Computer Weekly exhibition. Organised by IPC Exhibitions Ltd.

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Compec North '82 tickets. IPC Exhibitions Ltd, Surrey House, 1 Thrayway Way, Sutton, Surrey SM1 4QQ.

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ADDRESS .....

(Applications not accepted after June 14. No school parties or children under 16.)

*John 130*







# Appointments Appointments Appointments

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# ON THE HORIZON

## A DP Development to meet the needs of the 1990's

The NLA Tower in Croydon, the image in our binoculars, is the home of Hill Samuel Life Assurance (HSLA), a member of the famous Hill Samuel Group (merchant banking, insurance, pensions, shipping). HSLA is about to expand its computing power significantly, to cater for the corporate systems needs into the 1990's. A whole new range of systems is to be developed for users, both directly by the systems and programming group and by the application of user tools, such as APL, report generators etc. Hardware will be dramatically increased to a triple processor installation, two IBM 4341's and a 4331, and the plans to house it focus upon a dramatic new underground, ultra-modern computer building. The new development program needs considerable expansion of people resources, in both Systems Development and Production Services, and HSLA will be expanding its DP department by over 60% in the next year. This has to be one of the major new computer systems developments South of the Thames, commenced within the last twelve months. On the horizon is a great job opportunity with technical and development interest for years to come - here today is the entry point for you to join the team.

### PROJECT MANAGER

C.£16,000 + Benefits

The Project Manager is responsible to the Systems Manager for projects in the conventional policy servicing and accounting area, which together with the unit linked and sales support teams service the users systems needs. Each team contains about twelve staff.

The Project Manager must be capable of managing several projects at once, with good people management and motivation skills. Experience should include a proven record of success in project management and control. Previous background must include systems analysis and design and programming. Application experience should include working in the policy servicing field for a life assurance company.

Awareness is needed - of the aims of senior management and of the problems of users at all levels and technical DP people within the team. Communication, motivation and achievement within the company systems plan must be the aim.

All positions enjoy the HSLA benefits package:

- \* Productivity Bonus \* Mortgage subsidy scheme.
- \* Non-Contributory pension \* Luncheon Vouchers
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For further information please telephone (24 hour answering service) or write quoting ref: CW12-2J. All positions are open to both men and women.

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### PROJECT LEADER

C.£13,000 + Benefits

A key position leading a group within the project team, with the main day to day responsibility for the development of a project to time and within budget. The Project Leader will be expected to have sufficient experience to define timescales, in both the systems and programming areas. There will be a great deal of user contact at all stages of development of the project. The project team will need management, both personal and technical. The Project Leader's background must include working in a large mainframe environment and significant analysis and programming experience on complex systems.

### SYSTEMS ANALYSTS

C.£10,000 + Benefits

The bridge between the business requirements of the user and technical definition for the programmers. An analyst must have the personality and ability to work closely with users and with all levels of technical colleagues. Background must include the successful implementation of at least one system (or major subsystem) and a programming background.

### LEAD PROGRAMMERS

C.£12,000 + Benefits

The major programming role within the team - technically advisory, capable of complex programming, with the ability to define and meet targets of time, both elapsed and budgeted. A significant programming background in COBOL, in an IBM OS/VS or MVS environment is required. Ideally also 4300 series experience with DOS/VSE and CICS. The Lead Programmer must have the personality to lead, train and encourage other programmers to success.

### PRODUCTION CONTROL MANAGER

C.£13,000 + Benefits

A crucial position in the daily running of the computer installation. The computer operating and off-line services section report into this management level, with a staff of six. The Production Control Section responsible for the operational analysis, installation, production maintenance, scheduling, media control and back-up and recovery of application systems, also rests with this job, with a staff of five.

Relevant experience is critical, dealing with both users (at all levels including Director) and managing computer operations staff. Technical experience must include operations analysis, writing of MVS/JCL, a good understanding of VSAM and preferably experience of VM/CMS. This position reports to the Production Services Manager.

### SENIOR PRODUCTION CONTROLLER

C.£8,500 + Benefits

The main area of responsibility is application systems - installation, production maintenance, investigation and correction of failures and the provision of accurate documentation. Experience must include liaison with users (including systems development), creating and maintaining VSAM files, OS/JCL writing and operating. Operations analysis experience is an additional bonus. This position reports to the Production Control Manager.

### SENIOR OPERATIONS CONTROLLER

C.£8,500 + Benefits

To assist in the investigation and selection of user tools, especially in the package area. Other responsibilities include installing and maintaining VM and looking after hardware, both at installation and fault finding levels and in planning for future need.

Experience should include dealing with all levels of user, creating and maintaining VSAM files, VM/CMS operations and at least four years in operations (preferably DOS) and of JCL writing. This position reports to the Computer Facilities Manager.

## CONCENTRATE on SYSTEMS ANALYSIS in Cambridgeshire

Are you troubled by the pace of life - the turmoil and hubbub of modern living? If you have difficulty in concentrating and can't relax . . . . . Our client, a well-established and highly successful business, who's manufacturing function 'ENVELOPS' a considerable share of the UK market, now part of the Reed Group, still retains its essential family atmosphere. The Environment, situated on the original farm which has been carefully preserved. The company's keen commitment to EDP together with the relaxed working environment stimulate total dedication. The Requirement. If you can offer strong systems analysis experience in a manufacturing environment gained on DEC hardware and previous programming experience in BASIC+2 with RMS 11 file management system - then our Client can offer you: The Opportunity to liaise closely with the user departments at the Regional Development Centres throughout the county and provide the necessary interface between them and the Software Development team. You will be involved with development of new manufacturing systems. Initially preparing the requirement documentation and checking that the submitted specifications accord with these requirements. You will report directly to the Systems Manager. The Package. If you are willing to relocate to rural Cambridgeshire, our Client can offer a very generous and comprehensive package for assistance to include: ALL legal fees and expenses PLUS a disturbance allowance for incidentals PLUS annual salary circa £11K

For more information on this substantial career move - contact PETER JEZEPEH on CAMBERLEY 64252 or write enclosing a detailed C.V.

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In the first instance, telephone Mike Linford on: 01-370 2012/2013. Or send a brief CV for his attention to the address below. Any approach will be treated in the strictest confidence.

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- ★ Minimum of one year's HP 1000 experience
- ★ FORTRAN and/or ASSEMBLER languages
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The successful applicant will join a small team of specialists involved in the development of marine systems and the interpretation of data collection from ships based around the world. The position requires the ability to work independently, and offers the opportunity of international travel.

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Please apply to our London Office on 01-353 0981.

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## ANALYST/PROGS PROGRAMMERS

IBM DOS/VSE COBOL  
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We have been retained to engage Analyst Programmers to work in small project teams writing and testing COBOL CICS and DL/I programmes. To advise on design and programming aspects - a troubleshooting role. The Programmers will work on a variety of banking projects and be involved in the development of new real-time systems.

Company retains IBM 4300 machines running under DOS/VSE using Cobol, TP and Database. For the Analyst/Programming position applicants require a minimum of 2½ yrs IBM Cobol. Programmers need 18 months IBM Cobol and both these need some exposure to CICS and DL/I. TRAINING will be offered where necessary.

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## PROGRAMMER— MICRO- PROCESSOR SYSTEMS

who will be heavily involved in detailed design and development of microprocessor based terminal control software.

We are looking for someone who has knowledge of microprocessor development systems, communications protocol handling, and microprocessor hardware (e.g. 8085, 86000). Languages used: assembler, PLM and C.

A degree level in computer science would be a good starting qualification. To "fit the team" the preferable age would be around 25 years.

Raytheon offers competitive conditions, a challenging professional environment, and international opportunities.

Please send your resume to Raytheon International Data Systems, Joan Muyskenweg 22, 1096 CJ Amsterdam, the Netherlands, attn. Personnel Department, reference 82-8.

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London+UK travel £9K+Car++  
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A major designer and manufacturer of these systems is expanding his service network and requires an Engineer to provide customer service and sales support. Experience and success in the maintenance and support of similar microprocessed products in London is important.

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Maidenhead £9K+  
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My client, a successful consultancy, requires SENIOR PROGRAMMERS with a good academic and commercial background and with experience of designing systems for min/micro computers using COBOL and/or BASIC.

### Design Engineers

Surrey £8 to £12K+  
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My client is the successful designer & manufacturer of a range of micro-computers and is expanding the design team to work on the next generation of business systems. He needs a SENIOR DESIGNER and a PROJECT LEADER with 16 bit chip family experience and the appropriate high and low level software knowledge, and a good theoretical background.

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An associate company has won the contract to provide the staff for a new Petrochemical complex. I will shortly be looking for suitably experienced people who want to work in the USA for a year before relocating to Saudi for a further two year renewable contract.  
COBOL, CICS, IMS, OS/VS1, VM/CMS, VM/370 are all relevant.  
IF YOU FEEL YOU MATCH ANY OF THE ABOVE REQUIREMENTS please write to me, Gilbert van Soneren with full CV or phone me at any time Monday to Friday for more information, or an Application Form.

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Application form and further particulars obtainable from the Principal, Thurrock Technical College, Woodview, Grays, Essex (Telephone Grays Thurrock 71621) to whom completed forms should be returned within ten days of the appearance of this advertisement. (9523)

## UNIX Systems

Monotype International is a world-wide group of companies providing a complete systems approach to the Printing and Graphic Arts industry.

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### Software Engineer c£8,000

You will be able to demonstrate a professional approach to software development as well as having considerable practical experience of the C Programming Language.

### Systems Engineer c£10,000

You will be able to demonstrate a record of past achievement and should have a knowledge of UNIX/XENIX kernel programming. Familiarity with PDP 11 hardware would be an advantage.

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Advance Development Group,  
Science Park, Milton Road, Cambridge.  
Telephone: Cambridge 64018.

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## SCOTTISH EXAMINATION BOARD DALKEITH, MIDLOTHIAN

### SYSTEMS ANALYST AND PROGRAMMER POSTS

Salary scales £9999-£10941 and  
£6699-£7371 respectively

These are permanent staff posts. Systems Analyst applicants should have experience in analysing proposals, designing systems and preparing programmer specifications for Cobol and Fortran. Programmer applicants should have several years' experience of IBM Cobol and Fortran and previous operating experience would be of interest because assistance with two-shift operating will be required between March and June each year. For both posts knowledge of IBM computers, VM/CMS and JCL would be of particular advantage.

Conditions of service will be generally those of the Local Government Service. Application forms from Establishment Officer, Scottish Examination Board, Ironmills Road, Dalkeith, Midlothian EH22 1LE (Tel 031-663 6801) to be returned by June 4, 1982. (9541)

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# myriad

## Surrey/Berks Border

PDP-11  
Viewdata

## Software Development

Good educational background plus at least three years' Assembler programming and some knowledge of communications, preferably X25/PSS, etc.

## Service Engineers

also required, with a knowledge of the PDP-11 Architecture and Diagnostic Structure, and some appreciation of Data Communications.

To discuss these opportunities in confidence and arrange an early interview, please contact Myriad at Reading. Ref: RT1/1305

## Myriad Appointments Limited

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(9521)

# myriad

## Internal Consultancy

PDP 11/70

BASIC +

RSTS/E

The data processing group of a multi-national, British organisation also functions as a consultancy for the UK subsidiaries and two additional staff are now required to strengthen the team. The Company is well-established with interests in many different countries contributing to an annual turnover of approximately £250 million.

### Programmer

c. £9,000

Bletchley/City

To be primarily responsible for a major subsidiary, this person will require strong interpersonal skills as they will act as a link between London and the users in Bletchley. Applicants should have a sound knowledge of BASIC+ or BASIC+2 and be able to operate effectively under minimum supervision.

Both of these positions involve a large proportion of development projects using on-line software and DP staff are encouraged to expand their career potential and promote their services within the organisation. Employee benefits include a pension scheme with free life assurance, subsidised meals, an interest-free season ticket loan and two reviews per year.

For further information regarding these opportunities, contact our London office (01-353 0981) quoting reference S1/1305.

## Myriad Appointments Limited

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## Hardware Engineers

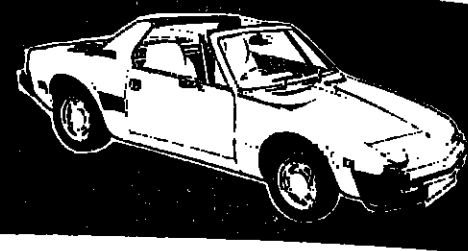
At least 18 months' in hardware development. Knowledge of Data Communications, Telephony, Micro-processors or VLSI would be of interest.

## Applications/Consultant

... various levels required  
between 18 months' and six years' experience, including Assembler programming.



## SYSTEMS PROGRAMMER HELP KEEP THE WHEELS TURNING

**FIAT LANCIA**

**c £10,500**

Fiat Auto (U.K.) Ltd. is one of the country's leading vehicle importers, with a wide and successful product range.

We are now at an exciting stage in our development, with opportunities for the right person to build on his or her systems programming skills in a small but lively technical support group.

Our new purpose-built Data Centre is based at Alorton in West London. We have an IBM 4341 using VM/CMS, DOS/VSE2, CICS, DL/1, VSAM, CICS/MM and Keymaster, supporting an expanding TP and RJE network. Planned enhancements include VM/SP, VM Passthru and APL.

We don't employ our systems programmers solely to install and maintain our system software—we believe in using their skills to develop additional software tools to aid our programmers, systems designers and operations staff.

### CHOICE OF COMPANY CAR

If you have a good knowledge of IBM Assembler, 2 to 3 years in systems programming and experience of some or all of our software (an operations background is also a plus), then you could well be the person we need.

As a large and progressive company we offer benefits to match. These include an extremely attractive car scheme which gives you the choice of any Fiat or Lancia car in our comprehensive range.

For additional details please telephone Sue Ashby and Anne Betts on 01-863 6775 (daytime) or 0844 53531 (evenings and weekends).

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Location: South West England Ref: 212/82

**ELECTRONICS ENGINEER** also required for the above installation.  
Ref: 312/82

**SYSTEMS PROGRAMMER** Univac 1100, Exec 8 + Data Communications.  
Location: The Netherlands Ref: 412/82

**SOFTWARE DESIGN ENGINEERS** with minimum 3 years industrial or military software systems experience. Some hardware knowledge advantageous.  
Location: U.K. and Overseas Ref: 512/82

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Location: U.K. and Overseas Ref: 612/82

We also have requirements for IBM or ICL Analysts and Programmers for a number of client projects.

Take this opportunity to discuss these and other requirements by phoning Mark Clifford or Edith Watson on (0462) 57141 (Day) or (0234) 46000 (Evenings to 9 pm) or write to:

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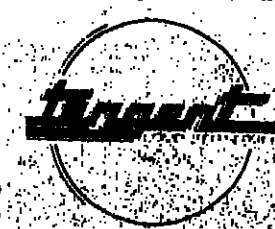
Our immediate domestic and international consulting needs are detailed below. If you are of a professional disposition, skilled and dedicated, and wish to join our growing permanent or contract staff, please contact us in respect of these and future opportunities.

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COBOL, Univac 1100 Team Leader, Programmers Essex  
COBOL, TSO/SPF, MVS Programmer London  
COBOL, VSAM Programmer London  
Burroughs 6800, COBOL Analyst/Programmers, Home Counties  
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For more information please contact:

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## ANALYST/PROGS PROGRAMMERS

IBM RPG III OR II  
SURREY £8-£18,000

Our client is based in North Surrey conveniently located for applicants who live in South London or Surrey. They are an internationally known software house who currently require Consultants, Analyst Programmers and Programmers to be office based in the main but occasionally at clients' premises.

Being a software house the work involved will be varied but in the main will revolve around IBM SYSTEM 34 and SYSTEM 38 hardware, full training in RPGIII will be given to RPGII Programmers. Application areas include Manufacturing, Process Control, Accounting, Insurance and Banking.

Ideally you will have upwards of two years' experience on IBM GSD hardware and be competent within the range of your current job title. You will also be career minded. These positions offer excellent career possibilities.

Applicants should apply in the first instances to Datascene Quoting Ref M.5926.

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Senior Systems Analysts

with 5 years relevant experience as principal designer/project leader for commercial database data communications systems.

### Programmer Analysts

- (a) 3-5 years experience in systems analysis, programming, implementation of systems 34 RPG in communications environment.
- (b) 3 years experience commercial applications, medium size mainframes, database design, on-line systems.

### Programmers

with minimum 2 years experience in Cobol on-line database systems. Experience with NCR VTX-TOTAL-TRAN-PRO-OLPD a plus but not essential.

These opportunities provide attractive salaries, free housing, tax exclusions, generous leave allowances and free medical care. All positions offer long term career prospects and are initially on bachelor status. Married appointees will receive a marital separation allowance.

Interested applicants should forward resume to Mr M.J. Piper quoting ref no 5081. A covering letter should indicate any organisation from whom it must be withheld.

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Telephone 01-373 3063

## Systems Consultants

Inner/Greater London: Salary to £16k

A market leader in the areas of office automation systems, information science technology and data communications requires a number of additional Senior Systems Consultants for its London based operations. All respondents, aged 28-35 years, should hold at least one numerate degree. It is essential already managed at least one major project to offer a minimum of five years' experience in systems design, consultancy and project leadership gained with either a major manufacturer or a total systems supplier. Candidates are expected to be fully au fait with technological market trends, particularly Local and Wide Area Networks, Videotex (Prestel/Viewdata) applications and more generally have a thorough understanding of distributed processing techniques. Of special interest will be those candidates who have already managed at least one major project from feasibility to final acceptance. For certain positions you will be required to undertake both national and international travel. Ref: L/19/A

## Hardware Q.A.

Cambridgeshire: Salary to £12k

A leading supplier of Hardware and Software Products has an immediate requirement for a Hardware Quality Control Manager. The Company's rapid expansion programme has created this new position. Suitable candidates will be expected to have wide range of products and services, you will be required to travel extensively both nationally and internationally. Ref: L/19/B

## Real-Time Applications

London/EEC: Salaries to £14k

A highly successful British Systems and Software House has outstanding opportunities for real-time software experts from Programmer to Team leader Level. Applicants should offer at least two years' real-time programming experience in either FORTRAN, PASCAL, MACRO II or Assembler. Particular hardware is not important, but you will be expected to have had exposure to a leading mini- or micro-computer. Application areas of interest are: Data Communications and Networks, Message/Packet Switching, Process Control or Defence. Candidates who demonstrate management potential will, of course, be considered for the more senior positions. Ref: L/19/C

## X25 Designers

N.W. England/U.S.: Pkg. to £15k

One of the world's leading suppliers of communications equipment has an urgent requirement for a number of X25 specialists. It is essential that all applicants are familiar with the physical data link and network layers of X25 and have worked in a communications environment for at least four years. Of special interest to our clients will be those respondents who are also able to offer knowledge of a major communications structure such as SNA or DNA. Initial product training will be undertaken at the Company's North American headquarters for a period of approximately 6 months and, subsequently, successful candidates will be located in either North West England or the South Coast. Ref: L/19/D

## Robotic Systems

N. Home Counties: Salaries to £11k

A supplier of total systems in the field of industrial automation is currently recruiting Programmer/Designers with a combination of hardware and software skills for its electronics division. Of special interest will be applicants with experience of designing microprocessor based instrumentation systems from board level upwards. At least one degree in Computing Science or Electrical/Electronic Engineering is essential, as is 2-3 years in an industrial environment where languages utilised. Working as members of multi-disciplinary teams, successful candidates will be involved in the design and development of micro-based complex machine control systems to meet individual customers' requirements. Ref: L/19/E

## Macro-II Programmers

London & W. Home Counties: Salaries to £11k

A major British Systems and Software House is seeking a number of Macro II Programmers. Suitable applicants will be graduates with a minimum of two years' real-time programming experience on a PDP-II configuration running under RSX 11/M. Fluency in Macro II is, of course, essential, but applicants able to offer additional skills in Fortran or Pascal will be especially favoured. As many of our clients' projects are communications orientated it will be a distinct advantage to have a knowledge of protocoling techniques, with particular emphasis on exposure at either the systems or application levels to Deent. Ref: L/19/F

## Graphics/CAD

Home Counties: Salaries to £11k

A market leader specialising in the production of computer systems for design applications is currently seeking additional Systems Programmers and Applications Support Consultants. Suitable applicants will be numerate graduates, preferably with a degree in either Mechanical or Civil Engineering. Subsequent industrial experience should include at least one year's Fortran or Assembler programming experience in either a technical or scientific environment. In particular, knowledge of Finite Element Modelling, Numerical Control or Computerised Drafting Systems would be a distinct advantage. All positions will involve a degree of national and international travel and, in certain circumstances a company car will be provided. Ref: L/19/G

## Industrial Control

Inner/Greater London: Salary to £15k

A London-based Total Systems Supplier has a number of vacancies for Applications Engineers and Project Leaders. For the more senior positions suitable candidates should have been acquired in a mini- or micro-computer environment. Candidates with other theoretical knowledge or practical exposure to robotics and artificial intelligence techniques are especially favoured. Ref: L/19/H

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# COMPUTER PROFESSIONALS FOR THE CITY

## ★★★ IBM Assembler/Cobol Programmers ★★★ to £9,000

Our client, a leading city bureau has asked us to carry out an extensive search for three competent Assembler Programmers, preferably with some COBOL experience, to work on twin IBM 4341 machines running under DOS/VSE. A minimum of 18 months' experience is required.

The applications areas are financial with particular reference to investment accounting systems used by insurance companies, Banks, Pension Funds, etc. Training will be given in CICS although an existing knowledge of the concepts involved is desirable. Opportunities to progress into senior positions within this large, well-established company are on merit and there is ample scope for internal promotion.

Benefits include 5 weeks' holiday, good pension scheme, twice yearly salary reviews and a challenging working environment.

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Stoy-MLH is an international management consultancy firm based in London, and is part of Stoy Hayward & Co., Chartered Accountants. Its assignments range from the management spectrum from accountancy to marketing, from data processing to production. Computer assignments cover a wide range of business systems, with emphasis on financial and stock control systems and on mini or micro hardware and software.

Demand for our computer consultancy services, in particular, now requires that we increase the size of our computer specialist team.

Successful candidates will likely be in their early 30's and either qualified accountants or university graduates. They will be experienced in advising on the introduction of both software and hardware to a wide range of businesses, and able to advise from the feasibility stage through to implementation. Public speaking experience on the subject would be an advantage, as would experience of communications and networking.

Salary will be commensurate with experience and is competitive. There is a contributory pension scheme, and BUPA membership is offered to consultants and their families.

Letters of application will be treated in confidence and should be forwarded with C.V., salary progression and any other relevant information, to Mr G. Henderson, Managing Director, Stoy-MLH, 128 Baker Street, London W1M 1FH.

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Management Consultants

### UNIVERSITY COLLEGE LONDON FACULTY OF CLINICAL SCIENCES COMPUTER PROGRAMMER A/SYSTEMS ENGINEER

required for the computer group which provides the computing services for the Faculty. A responsible knowledge of hardware and some software experience sufficient for maintaining the following equipment will be expected. A Cambridge Ring computer a PDP 11/34 with 70 H bytes of disc storage, running UNIX with a terminal calculator supporting a number of micro processors. A PDP 11/10 running RT 11 acting as an RJE to the ULCC computing facilities. Opportunities exist for research and development in relation to the Local Area Network being developed on the Cambridge Ring.

Salary scale - £5,542 to £8,488 plus £1,035 London Weighting.

Apply in writing to Personnel Officer (Technical Staff GP1), University College London, Gower Street, London WC1E 6BT.

(9816)

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#### LECTURER GRADE I IN COMPUTER STUDIES

A Lecturer Grade I is required for this newly created post. The successful applicant will join a young and enthusiastic team developing the teaching of computer studies throughout the college. Candidates should have either a degree in an appropriate discipline or a qualification in Computing. Some industrial experience and/or a recognised teacher training qualification would be an additional advantage.

Salary scale: Lecturer Grade I on an incremental scale within the range £5,034-£8,554 (plus £768 Inner London Allowance) starting points depend on qualification, training and experience.

Further details and application forms obtainable from the Senior Administrative Officer (PA) at the college (01-429 6661), returnable by May 28th, 1982.

(9498)

### BOX NUMBERS

Box number replies should be addressed to:  
Box Number

to Computer Weekly  
Quadrant House  
The Quadrant  
Barton Surrey GU2 5AS

## Local Area Network and Multifunction Workstation Software Designers

Xionics, the British local area network manufacturer widely regarded as the world's most advanced office automation supplier, needs a number of software specialists to help develop the exciting Xibus/Xinet system in the realms of voice and video communications.

### Communications Software Designer London £12,000-£20,000

This key position requires substantial real-time communications experience and involves local area network software design, real-time communications in the packet-switching environment, and resilient systems design.

### Customer Support Specialists London £12,000-£18,000

Several experienced programmers/analysts are needed to work closely with users on the design and specification of new Xibus applications, particularly in the fields of interface development and inter-system communications.

### Workstation Software Designer London £10,000-£15,000

A senior post, requiring experience of application design and implementation, together with a creative approach to user interface development.

Please write with C.V. to:

Ian Richardson, Technical Director  
Xionics Ltd  
Dumbarton House, 68 Oxford Street, London W1N 9LA

**XIONICS**

### Technical Support S/W

Manchester c. £12.5K + car  
Yet more expansion for this remarkably successful company creates an opportunity to join their new Manchester office. You will need several years technical software experience to include: real time, data comms, and/or data base systems, or operating systems. Starting dates are linked to internal training schedules. You cannot fail to be impressed by this client.  
Contact Terry Harvey

### IBM Progs. Dev/Support

Berks. to £11K + car  
Our client is an international company leading the field in the supply of application packages to IBM mainframe users. Seasoned Cobol programmers are required to join the European Technical Support Team. You will work in both a development and support capacity. Very attractive working conditions and benefits are offered by this progressive world-wide company.  
Contact Tim Bridges

### 50+ Vacancies Systems H'ses

H. Counties/Europe to £17,000 +  
We only work for the best companies. Our clients have many varied projects in all parts of the U.K. and Europe. If your experience is in minis/micros with technical application or systems software you may not be realising your full potential. DEC PDP11/VAX, ARGUS 700, H.P. 3000, Intel, Motorola, Texas DEC LSI micros, CORAL, PASCAL, RT1/2, Assemblers etc. are of most interest.  
Contact Terry Harvey

### Programmer Analyst

C. London to £11K  
Our client is the Minicomputer Business Systems group within a large international financial organisation. An additional programmer/analyst is required to work on the development of packages for a range of equipment including PDP11, Wang 2200 and IBM 5120. Candidates must be degree level. COBOL, BASIC essential, DIBOL very useful. Attractive company benefits.  
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### Project Manager

W. Middlesex to £13,000  
The ideal candidate for this position will have a wide application of micro computer applications in business and commerce with a technical knowledge of, or experience in Local Area Networking. You will be capable of designing products which integrate components in a LAN environment. You will have the skills to plan and control and will maintain technical awareness.  
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### Programmers Micros/Comms

Berks. to £11,500  
Our clients are seeking programmers to join in the development of their micro based, communications orientated systems. Graduate level candidates preferred although two to three years experience in Pascal, Assembler or Fortran would be of interest as would experience with CICS, COBOL, CP/M, Unix and DEC knowledge would also be attractive.  
Contact Tim Bridges

### Project Manager

W. Country to £10K + car  
We would like to hear from candidates with experience in the development of commercial or business systems. Ideally you will have had project control responsibility. Our client's environment is a small, systems house. They will be looking for a good client relations manager. Less experienced candidates will be considered for support positions. DEC systems and Basic/Dibol useful.  
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### RPG Prog. System 38

London Base to £10K + car  
Experienced System 34 or 38 RPG programmers are required to join a highly successful company developing and marketing a comprehensive range of commercial packages for IBM (AS) equipment. Marketing oriented and presentable candidates are ideally suited to these positions as extensive client contact will be required with the opportunity to develop support skills.  
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### S/W Engineer Micros

W. Herts. c. £10,500  
This is an interesting and challenging opportunity for a technical programmer with an understanding of micro architecture to join a company which is in the forefront of micro applications to medical systems. A knowledge of Z80 assembler plus a high level language would be useful. There is potential for promotion to project leader in the near future.  
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A leading international company supplying a wide range of IBM mainframe software products require IBM assembler programmers. You will be expected to work in the design, development and support of new and existing products. You must demonstrate total commitment to this type of work. Product training on in-house equipment. Some travel to USA and Europe is possible.  
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Open letter to technical and commercial job seekers at all levels:

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Write, or telephone us during office hours as below.  
Any other time call Terry Harvey on: Great Missenden (02406) 4705, Tim Bridges on: The Lee (024 020) 502.  
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**HR**

### Surrey County Council GUILDFORD COUNTY COLLEGE OF TECHNOLOGY COMPUTER UNIT

#### (Department of Science and Electrotechnology) PROGRAMMER REQUIRED

for the College's Computer Unit to work in a variety of Languages, but mainly COBOL and BASIC on an ICL 2904 and various microcomputers.  
Salary scale £6,501-£7,676 plus £237 Surrey Allowance  
Further details and application form from The Vice Principal, Guildford County College of Technology, Stoke Park, Guildford, Surrey, GU1 1EZ on receipt of SAE. (Tel: Guildford 31251.)  
Closing date: Friday, 28th May 1982

### TEESSIDE POLYTECHNIC COMPUTER CENTRE

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To join the Applications Team, responsible for supporting a wide range of languages and applications software for Polytechnic users. The post offers excellent opportunities for both technical and professional development.  
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Applications forms and further particulars are available from: The Personnel Section, Teesside Polytechnic, Darlington Road, Middlesbrough, Cleveland TS1 1BA. Telephone: 0462 21011 Ext 4114.  
Closing date for applications: Friday 28 May 1982

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All appointments are subject to a satisfactory medical report and to the provisions of the Local Government Superannuation Acts.  
Candidates should either directly or indirectly, will disqualify.  
Application form and further details obtainable from The Chief Constable, Durham Constabulary, Police Headquarters, Leazes Road, Durham, DH1 1TF (Tel: Durham 64226, Ext. 281). Closing date 28th May, 1982.

(9227)

### CANADA URGENT REVIN CANADA urgently require

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For further information please telephone:  
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### MANCHESTER POLYTECHNIC Computing Services Unit PROGRAMMERS

The posts entail provision of support to academic staff, and writing programs in a range of languages. Applicants must have degree level qualifications and one year's employment as a programmer. The posts require experience in a Business Systems or CAL, b) Pascal or Algol and Scientific Applications. A PRIME B50 with 80 terminals has just been installed. A Union Membership Agreement is in operation under which new employees are required to join a recognised union. For further details and application form (returnable by 28 May 1982) send a self-addressed envelope marked 'REVIN' to: Manchester Polytechnic, All Saints, Manchester M1 6PT.

### ANALYST/PROGRAMMER

SAPPA PLC, established poultry farmers, hatcherymen and egg wholesalers, has vacancies for an experienced Analyst/Programmer and a Junior Programmer with knowledge of D.G. Business Basic under R.D.S.  
The work will involve development and maintenance of software applications in the agricultural field. Salary will reflect experience. Please apply in writing, with C.V., to: D. J. Telling, Company Secretary, SAPPA PLC, 21 Northgate Street, Bury St. Edmunds IP38 1JA. (9490)

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With us you'll be in your element based at Beaumont, our own college in Berkshire, and also visiting clients' locations in the UK and overseas as you hold on-site courses designed to meet individual requirements.

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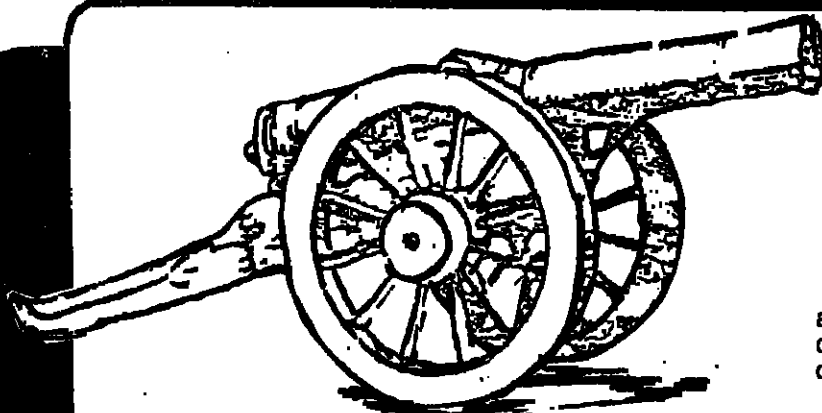
We can offer competitive salaries and assistance with relocation where appropriate.

If you'd like to know more, and are sufficiently mobile to spend up to two weeks at a time away from home base, please phone or post your career details to: Michele Barron or Sylvia Tingley, International Computers Ltd., Beaumont, Old Windsor, Berks, SL4 2JP. Tel: Windsor 68181. Please quote Ref. C2120.

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Please telephone: SUE ASHBY or ANNE BETTS 01-836 6775 (daytime), 0844 53531 (evenings)

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**Excellent Salary & Benefits Package**  
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An opportunity within a leading international company has arisen for a database administrator. They operate a friendly, medium-sized environment utilising an IBM 4341 running under DOS and CICS. The successful candidate, who should have a minimum of 1 year's database experience, will help to support and develop DL/1 databases in addition to VSAM & DATADictionary involvement. In-depth training is available where necessary, although preference is given to those with existing DL/1 experience. The company offers an excellent salary and benefits package which includes three reviews per year, free lunches and relocation expenses. Ref: T1273

### PROGRAMMERS

**London Based** **To £10,000**  
A rapidly-expanding software house is looking to recruit several COBOL and RPG II programmers to work in and around the London area. These are excellent opportunities for career-minded professionals who have a minimum of 18 months' experience. Successful candidates will receive in-house training, top salaries and the chance to work with the latest hardware and software. Ref: T1274

### ANALYST/PROGRAMMERS (SUPPORT)

**Herts base - European travel** **To £11,500 + car**  
Our client, a leading manufacturer of minicomputer and intelligent terminal equipment, requires a number of analyst/programmers to provide client support across Europe. Candidates should have solid COBOL experience and previous involvement in a computer manufacturer/software house environment. Ref: W1287

Please, telephone for further details, or send your CV to the address below, quoting the appropriate reference number.



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Data Processing Consultants  
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London W1P 9AF  
Tel: 01-636 7584

## Real Time Mini wants your experience

Particularly urgent needs at present are for Software Engineers with a minimum of 5 years' experience of radar systems, to join a London based software house but able to work in the Essex area.

Next plaintive pleas are for Software Consultants with tele-communications experience for U.K. and overseas positions. We are particularly interested in those experienced in communication protocols i.e. X.25.

From programmer to consultant level we have requirements for experience in the following applications:

**Industrial Control - Communications (all manner of) - Military Systems - Simulation - C.A.D. Systems - Office Automation - etc.**

**Languages: High and low level.**

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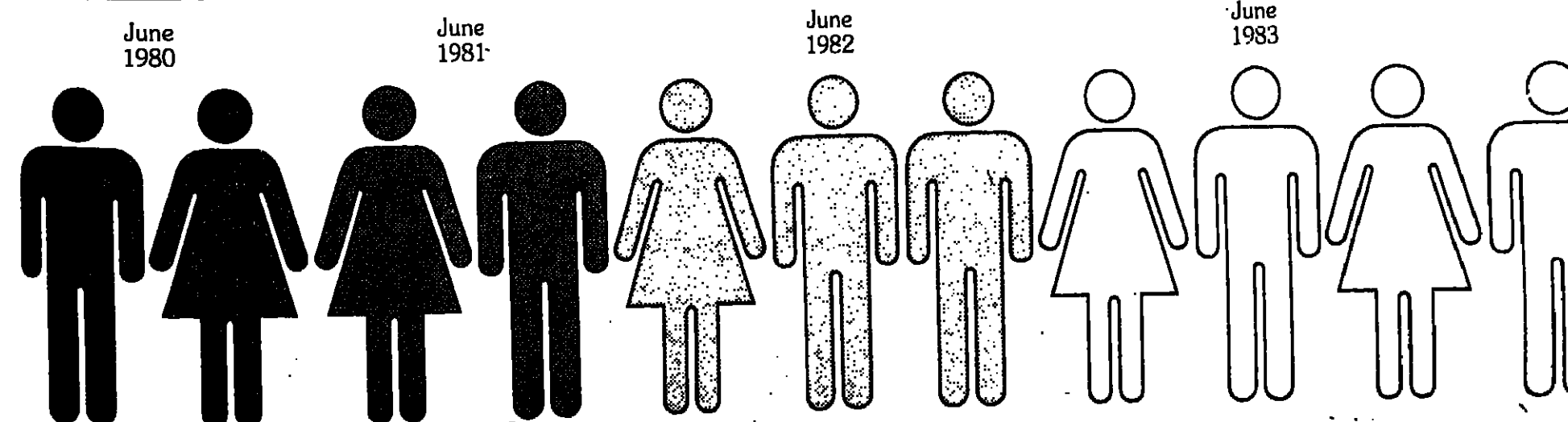
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**in excess of £12,500 + car**

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(5391)

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• **1994** – **1995** – **1996** – **1997** – **1998** – **1999** – **2000** – **2001** – **2002** – **2003** – **2004** – **2005** – **2006** – **2007** – **2008** – **2009** – **2010** – **2011** – **2012** – **2013** – **2014** – **2015** – **2016** – **2017** – **2018** – **2019** – **2020** – **2021** – **2022** – **2023** – **2024** – **2025** – **2026** – **2027** – **2028** – **2029** – **2030** – **2031** – **2032** – **2033** – **2034** – **2035** – **2036** – **2037** – **2038** – **2039** – **2040** – **2041** – **2042** – **2043** – **2044** – **2045** – **2046** – **2047** – **2048** – **2049** – **2050** – **2051** – **2052** – **2053** – **2054** – **2055** – **2056** – **2057** – **2058** – **2059** – **2060** – **2061** – **2062** – **2063** – **2064** – **2065** – **2066** – **2067** – **2068** – **2069** – **2070** – **2071** – **2072** – **2073** – **2074** – **2075** – **2076** – **2077** – **2078** – **2079** – **2080** – **2081** – **2082** – **2083** – **2084** – **2085** – **2086** – **2087** – **2088** – **2089** – **2090** – **2091** – **2092** – **2093** – **2094** – **2095** – **2096** – **2097** – **2098** – **2099** – **2100** – **2101** – **2102** – **2103** – **2104** – **2105** – **2106** – **2107** – **2108** – **2109** – **2110** – **2111** – **2112** – **2113** – **2114** – **2115** – **2116** – **2117** – **2118** – **2119** – **2120** – **2121** – **2122** – **2123** – **2124** – **2125** – **2126** – **2127** – **2128** – **2129** – **2130** – **2131** – **2132** – **2133** – **2134** – **2135** – **2136** – **2137** – **2138** – **2139** – **2140** – **2141** – **2142** – **2143** – **2144** – **2145** – **2146** – **2147** – **2148** – **2149** – **2150** – **2151** – **2152** – **2153** – **2154** – **2155** – **2156** – **2157** – **2158** – **2159** – **2160** – **2161** – **2162** – **2163** – **2164** – **2165** – **2166** – **2167** – **2168** – **2169** – **2170** – **2171** – **2172** – **2173** – **2174** – **2175** – **2176** – **2177** – **2178** – **2179** – **2180** – **2181** – **2182** – **2183** – **2184** – **2185** – **2186** – **2187** – **2188** – **2189** – **2190** – **2191** – **2192** – **2193** – **2194** – **2195** – **2196** – **2197** – **2198** – **2199** – **2200** – **2201** – **2202** – **2203** – **2204** – **2205** – **2206** – **2207** – **2208** – **2209** – **2210** – **2211** – **2212** – **2213** – **2214** – **2215** – **2216** – **2217** – **2218** – **2219** – **2220** – **2221** – **2222** – **2223** – **2224** – **2225** – **2226** – **2227** – **2228** – **2229** – **2230** – **2231** – **2232** – **2233** – **2234** – **2235** – **2236** – **2237** – **2238** – **2239** – **2240** – **2241** – **2242** – **2243** – **2244** – **2245** – **2246** – **2247** – **2248** – **2249** – **2250** – **2251** – **2252** – **2253** – **2254** – **2255** – **2256** – **2257** – **2258** – **2259** – **2260** – **2261** – **2262** – **2263** – **2264** – **2265** – **2266** – **2267** – **2268** – **2269** – **2270** – **2271** – **2272** – **2273** – **2274** – **2275** – **2276** – **2277** – **2278** – **2279** – **2280** – **2281** – **2282** – **2283** – **2284** – **2285** – **2286** – **2287** – **2288** – **2289** – **2290** – **2291** – **2292** – **2293** – **2294** – **2295** – **2296** – **2297** – **2298** – **2299** – **2300** – **2301** – **2302** – **2303** – **2304** – **2305** – **2306** – **2307** – **2308** – **2309** – **2310** – **2311** – **2312** – **2313** – **2314** – **2315** – **2316** – **2317** – **2318** – **2319** – **2320** – **2321** – **2322** – **2323** – **2324** – **2325** – **2326** – **2327** – **2328** – **2329** – **2330** – **2331** – **2332** – **2333** – **2334** – **2335** – **2336** – **2337** – **2338** – **2339** – **2340** – **2341** – **2342** – **2343** – **2344** – **2345** – **2346** – **2347** – **2348** – **2349** – **2350** – **2351** – **2352** – **2353** – **2354** – **2355** – **2356** – **2357** – **2358** – **2359** – **2360** – **2361** – **2362** – **2363** – **2364** – **2365** – <



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W. LON ANALYST PROGRAMMERS to £10,000

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WEST LONDON BORDERS ANALYST/PROGRAMMERS to £10,000

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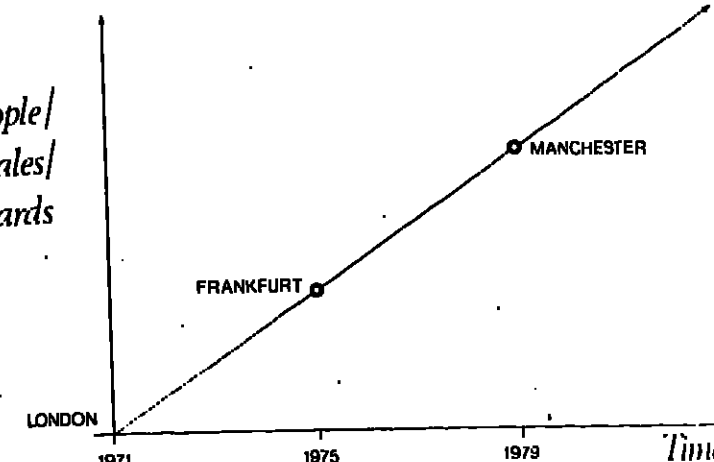
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Required to implement an IBM 4331 for our client a subsidiary of a large banking group. As one of four senior managers responsible to the directors you will play a major part in the running of the company. Initially you will be involved in the selection of software and staff. The site is likely to grow to around 20 staff. To facilitate speedy implementation some packages may be used if found to be suitable. DL1 and CICS are also likely to be used.

Applicants should be aged 30-45 currently holding a managerial position on an IBM mainframe. Some exposure to DOS/VS Realtime and Database systems is essential. For further details please quote: Ref. S/6985

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URGENT requirement - for full details, quote: Ref. J/7055

For full details, in strict confidence, please contact SIMON BERRY on 01-388 0111 or tonight on 0689 50249.

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IBM DOS BAL, VTAM,  
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(0442)

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Applicants should have a working knowledge of Fortran or an allied language and have proven skills in developing and documenting applications programs. Experience on one of the following areas would constitute an additional advantage: RSX11M MACRO-11, CPM, Z-80 Assembler, Real-time process programming, Signal Processing, Data-Base Management. An appointment will be made on the Executive Officer scale (£4095-7247) or the Higher Executive Officer scale (£7476-9184) according to qualifications and experience.

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APPL 1.30



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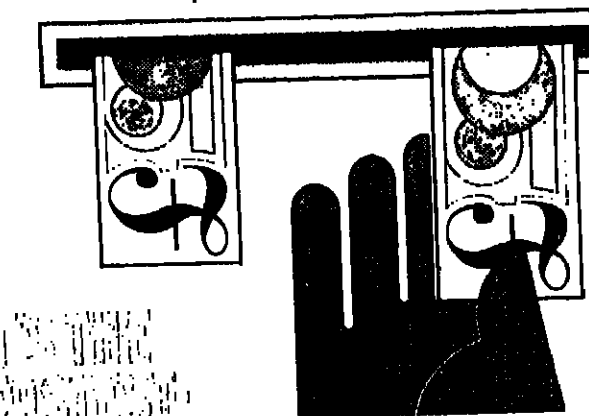
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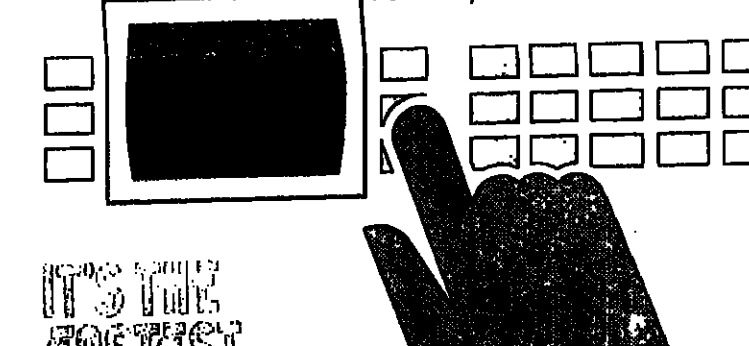
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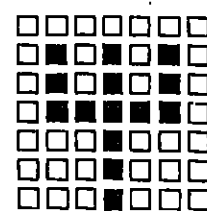
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Office 154



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